AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER AREA, ALASKA

Emond, A.M., Graham, G.R.C., Drenth, B.J., Jones, J.V.III., and EON Geosciences Inc.

Geophysical Report 2019-1

2019
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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http://doi.org/10.14509/29737

AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER AREA, ALASKA

Emond, A.M.,[1] Graham, G.R.C.,[1] Drenth, B.J., [2] Jones, J.V.III.,[3] and EON Geosciences Inc.

ABSTRACT

The Porcupine River fixed wing aeromagnetic geophysical survey is located in eastern Alaska, along the Canadian border, in the Sheenjek and Black mining districts. This survey is located about 135 kilometers east of Fort Yukon, Alaska and about 85 kilometers east of Circle, Alaska. Magnetic data were collected with a Geometrics G-822A cesium-vapor split-beam sensor mounted in a tail stinger. Between May 5th and June 28th, 2017, a total of 50,329 line kilometers were collected covering 13,646.9 square kilometers. Data were collected at a line spacing of 300 meters (m) with a mean ground clearance of 235 m.

PURPOSE

The survey data will be used by USGS, DGGS, and other researchers to better understand the crustal suture between Arctic Alaska and North America. Both the North American and Arctic Alaska successions contain rift- and arc-related volcanic and plutonic rocks associated with substantial mineral endowment farther west in the Brooks Range and to the east in the Selwyn Basin of Yukon Territory. The boundary of the two terranes is inferred to lie in a broad corridor parallel to the Porcupine River near where it crosses the international border. The data will also assist with evaluation of the mineral-resource potential for land-management planning.

SURVEY OVERVIEW DESCRIPTION

This document provides an overview of the survey and includes text and figures of select primary and derivative products of this survey. A table of digital data packages available for download is provided to assist users in data selection. For reference a catalog of the available maps is presented in reduced resolution. Please consult the metadata, project report, and digital data packages for more information and data.

ACKNOWLEDGMENTS

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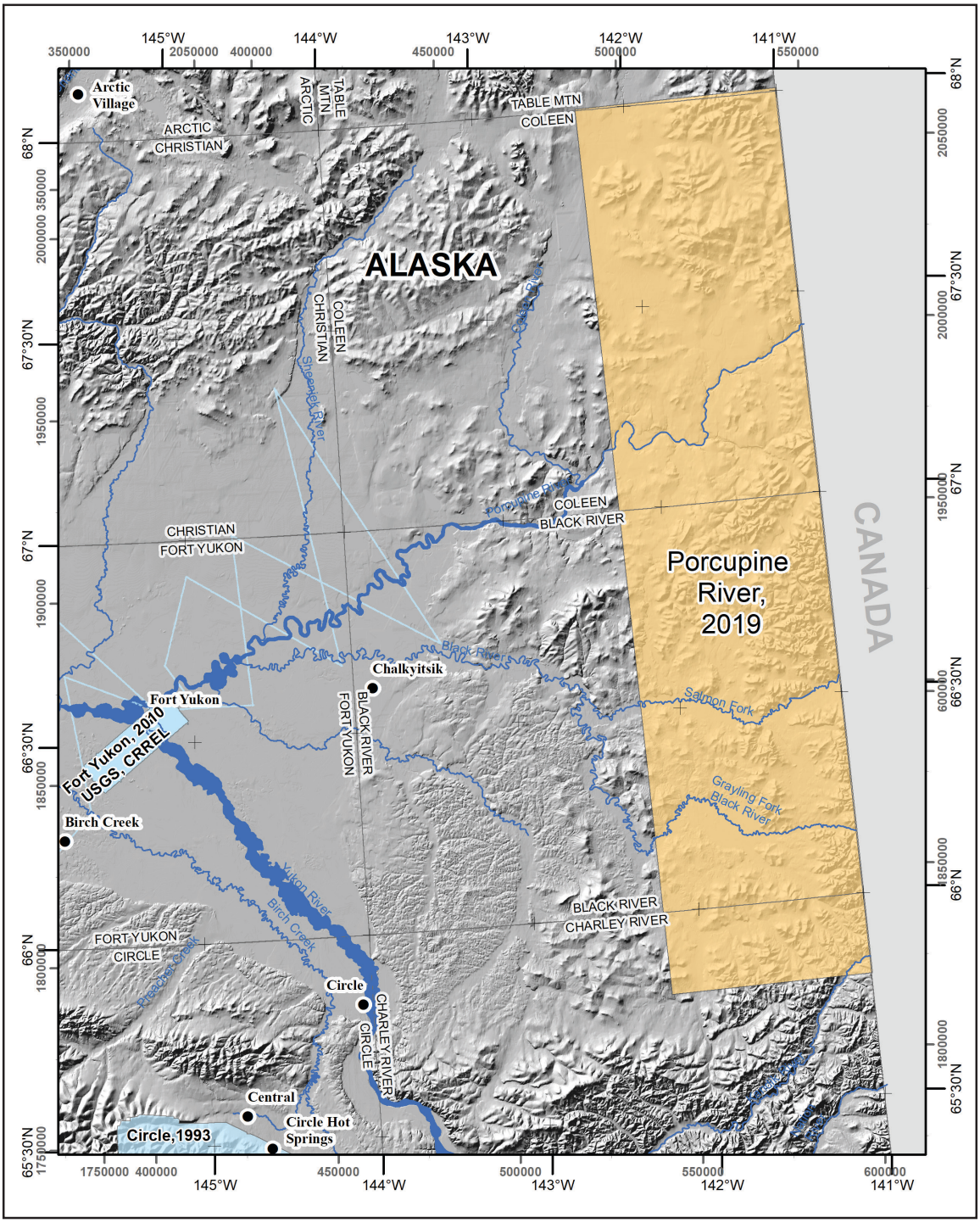
[3] Alaska Science Center, 4210 University Drive, Anchorage, AK 99508

AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of line data, other Geosoft format databases
documents	contractor and DGGS	Project and field reports, survey background information, gridded data explanations, other supporting documentation
grids_ermapper	contractor and DGGS	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor and DGGS	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft
images_registered	DGGS	GeoTiff format images of gridded data
kmz	DGGS	keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor	Printable maps in pdf format
vector_data	contractor and DGGS	Line path, data contours, and survey boundary in ESRI shape file (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format
video_flightpath	contractor	Survey flight path downward facing video



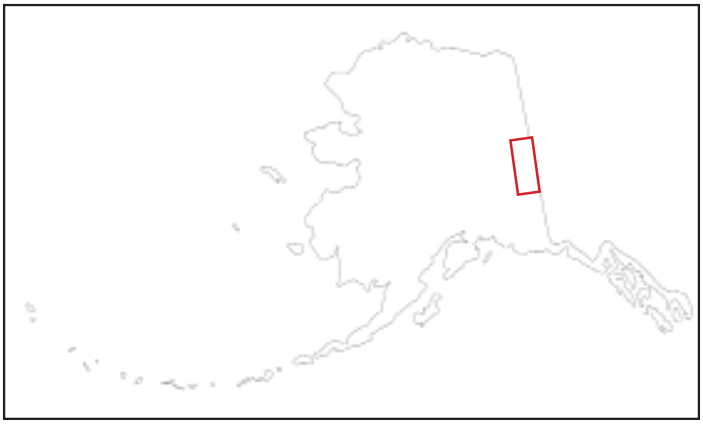


Figure 1. Porcupine River magnetic airborne geophysical survey location shown in north eastern Alaska (right). Porcupine River survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

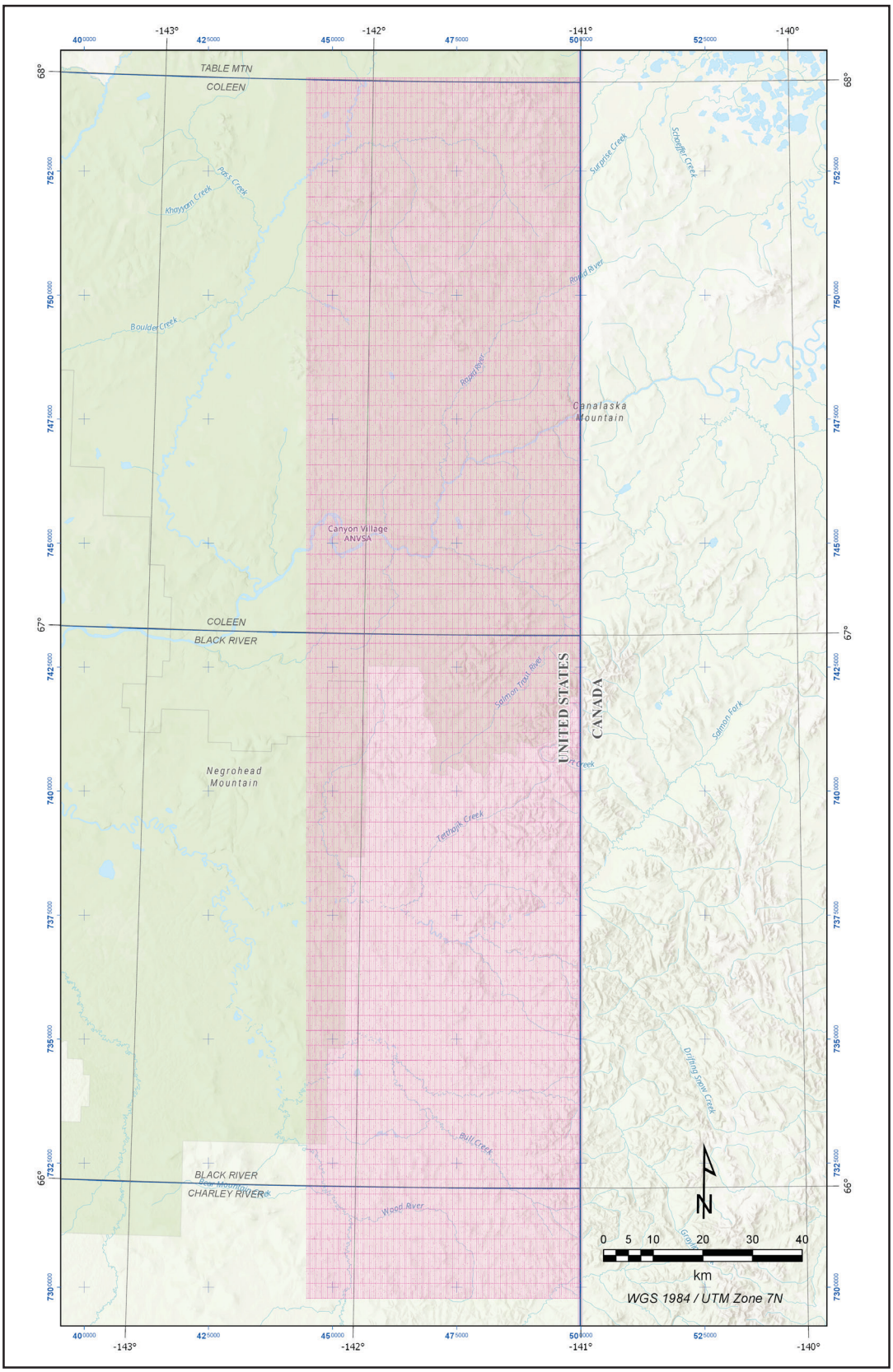


Figure 2. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional onboard equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

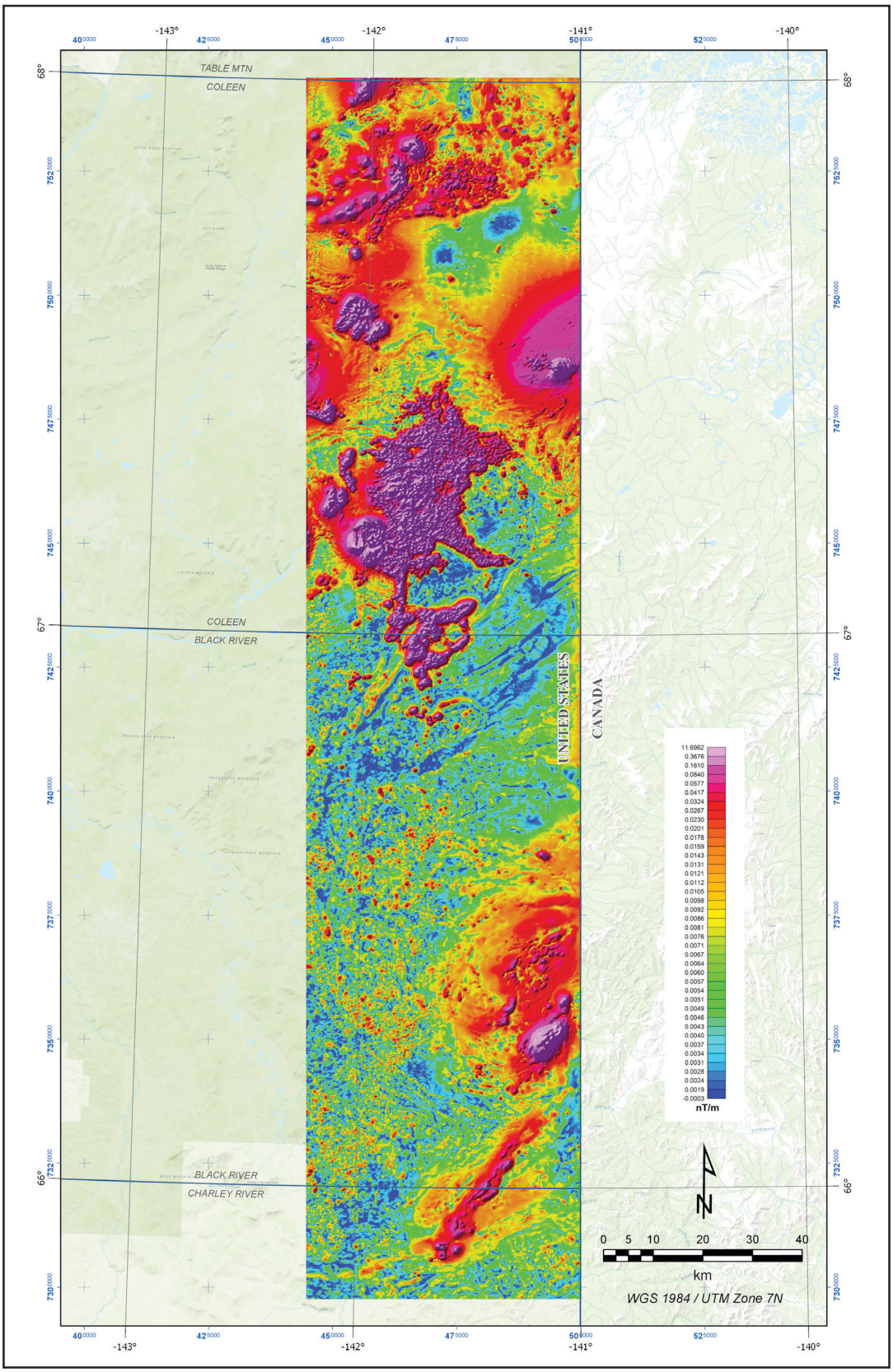


Figure 3. The analytic signal of the magnetic field is the total amplitude of the vector sum of the horizontal and vertical magnetic gradients. Computation of the analytic signal enhances the boundaries of magnetic anomalies and is independent of direction of magnetization. The data presented here were calculated from the residual magnetic intensity grid by: (1) computation of the total magnitude of the components obtained from the application of horizontal and FFT-based vertical derivative transfer functions, and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

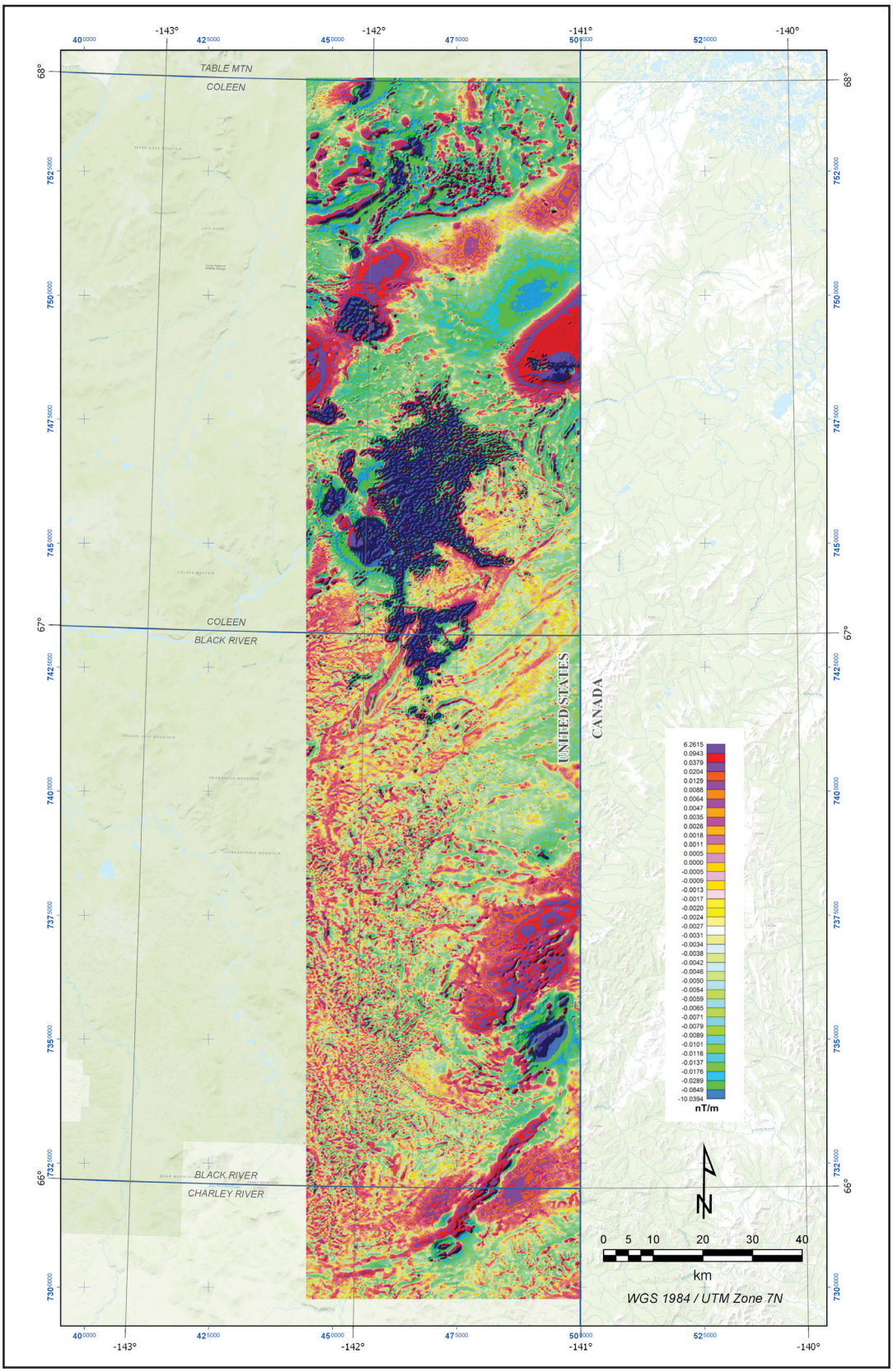


Figure 4. The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative enhances shorter wavelength features and improves resolutions of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by (1) application of an FFT-based vertical derivative transfer function and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

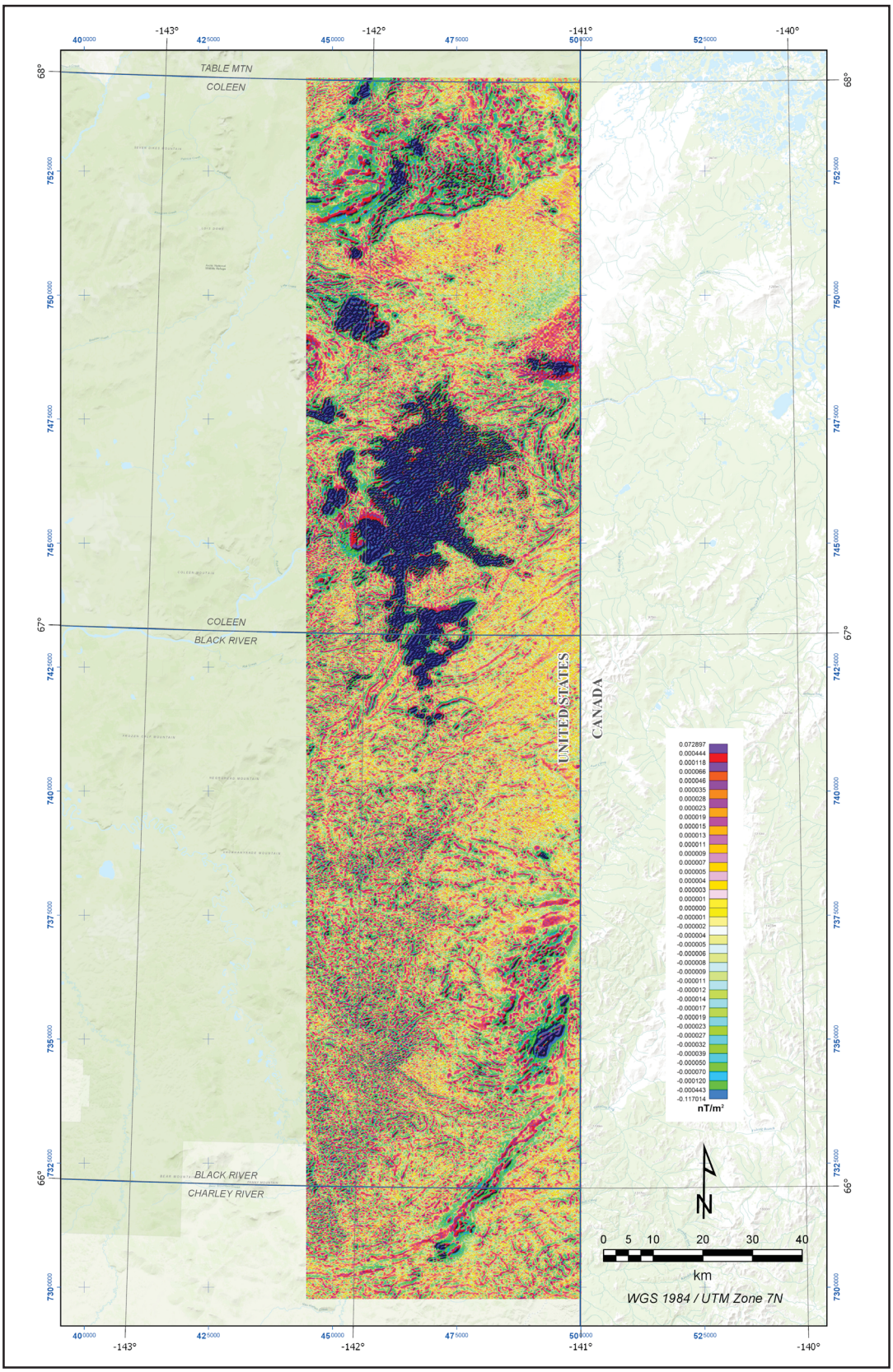


Figure 5. The second vertical derivative of the magnetic field is the curvature of the magnetic field with respect to the vertical direction. Computation of the second vertical derivative enhances shorter wavelength features and improves resolutions of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by (1) application of an FFT-based vertical derivative transfer function and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

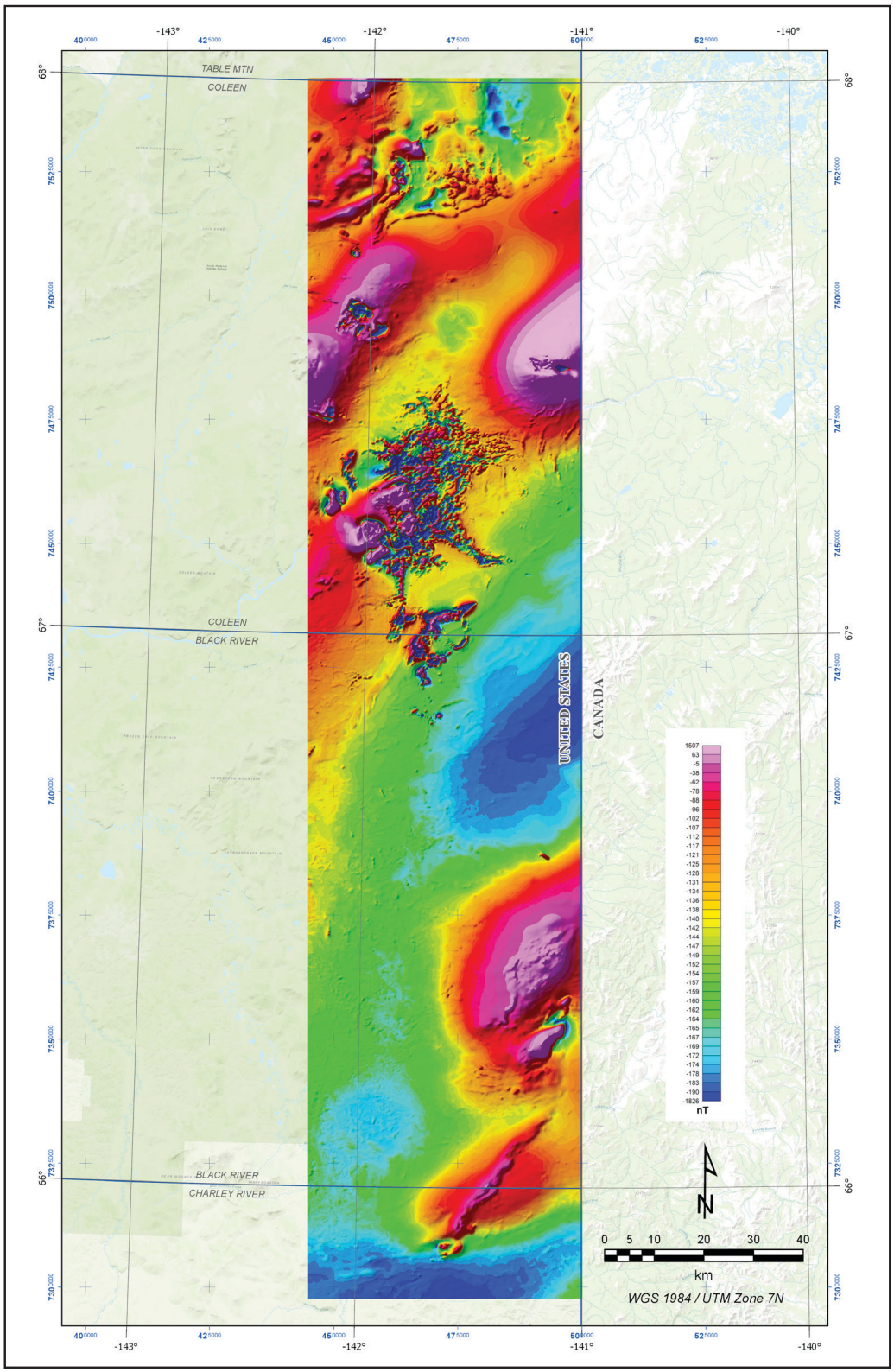


Figure 6. The residual magnetic field represents the component of the total magnetic field related almost entirely to the magnetic properties of the Earth's crust. The data presented here were derived from the recorded data by: (1) application of a lag to compensate for system latency, (2) correction against discrete spikes and high-frequency residual compensation noise, (3) application of a height correction derived from the International Geomagnetic Reference Field (IGRF) computed for flight and drape surfaces, (4) application of a diurnal correction derived from the magnetic base station data, (5) analysis of the remaining differences between the traverse and control line values at the intersection points to obtain a correction profile that results in mutually levelled line data, (6) application of a micro-levelling correction to further reduce residual noise, and (7) removal of the IGRF values defined at the average mean sea-level height of 690.0 m for a fixed date of June 1st 2017 to obtain the residual magnetic intensity. The final residual magnetic field was then gridded at a cell size of 60 m, using data from the traverse lines only.

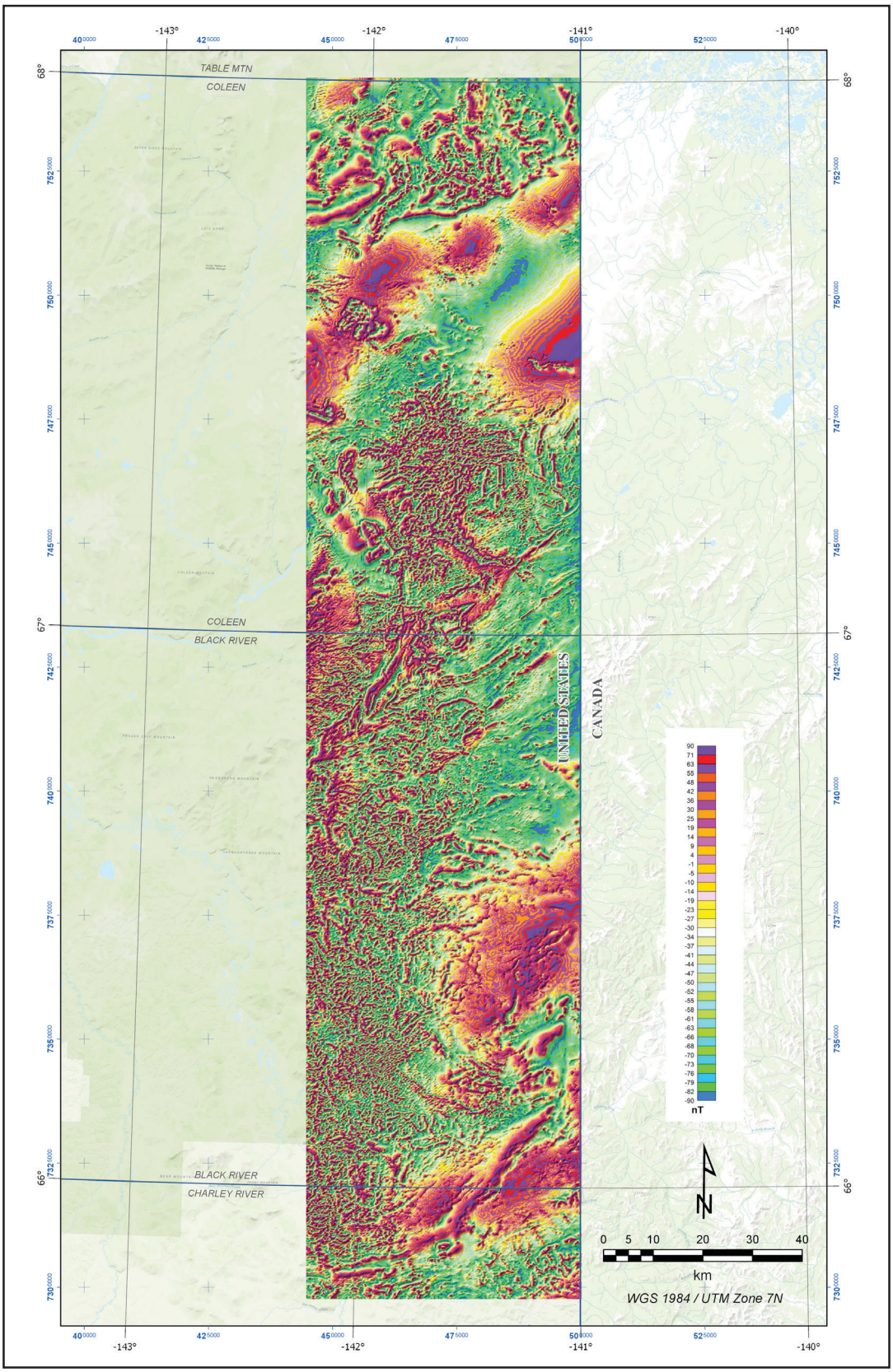


Figure 7. The tilt derivative of the magnetic field is its angle in the vertical direction with respect to the horizontal gradient. Computation of the tilt derivative is independent of magnetic intensity and depth to source, and therefore enhances weaker magnetic anomalies. The data presented here were calculated from the residual magnetic intensity grid by the application of horizontal and FFT-based vertical derivative transfer functions, and computation of the angle between the resulting components.

Table 1. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: http://doi.org/10.14509/29737.

Map Title	Description
porcupine_analyticsignal_1of4.pdf	analytic signal of the residual magnetic intensity with data contours and topographic base map
porcupine_analyticsignal_2of4.pdf	analytic signal of the residual magnetic intensity with data contours and topographic base map
porcupine_analyticsignal_3of4.pdf	analytic signal of the residual magnetic intensity with data contours and topographic base map
porcupine_analyticsignal_4of4.pdf	analytic signal of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated1vd_1of4.pdf	calculated first vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated1vd_2of4.pdf	calculated first vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated1vd_3of4.pdf	calculated first vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated1vd_4of4.pdf	calculated first vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated2vd_1of4.pdf	calculated second vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated2vd_2of4.pdf	calculated second vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated2vd_3of4.pdf	calculated second vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_calculated2vd_4of4.pdf	calculated second vertical derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_digital_terrain_model_1of4.pdf	digital terrain model with topographic base map
porcupine_digital_terrain_model_2of4.pdf	digital terrain model with topographic base map
porcupine_digital_terrain_model_3of4.pdf	digital terrain model with topographic base map
porcupine_digital_terrain_model_4of4.pdf	digital terrain model with topographic base map
porcupine_flightlines_1of4.pdf	flightlines with topographic base map
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porcupine_flightlines_3of4.pdf	flightlines with topographic base map
porcupine_flightlines_4of4.pdf	flightlines with topographic base map
porcupine_ground_clearance_1of4.pdf	ground clearance with topographic base map
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porcupine_ground_clearance_4of4.pdf	ground clearance with topographic base map
porcupine_residualmag.pdf	residual magnetic intensity grid with topographic base map
porcupine_residualmag_1of4.pdf	residual magnetic intensity grid with data contours and topographic base map
porcupine_residualmag_2of4.pdf	residual magnetic intensity grid with data contours and topographic base map
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porcupine_residualmag_4of4.pdf	residual magnetic intensity grid with data contours and topographic base map
porcupine_tiltderivative_1of4.pdf	magnetic tilt derivative of the residual magnetic intensity with data contours and topographic base map
porcupine_tiltderivative_2of4.pdf	magnetic tilt derivative of the residual magnetic intensity with data contours and topographic base map
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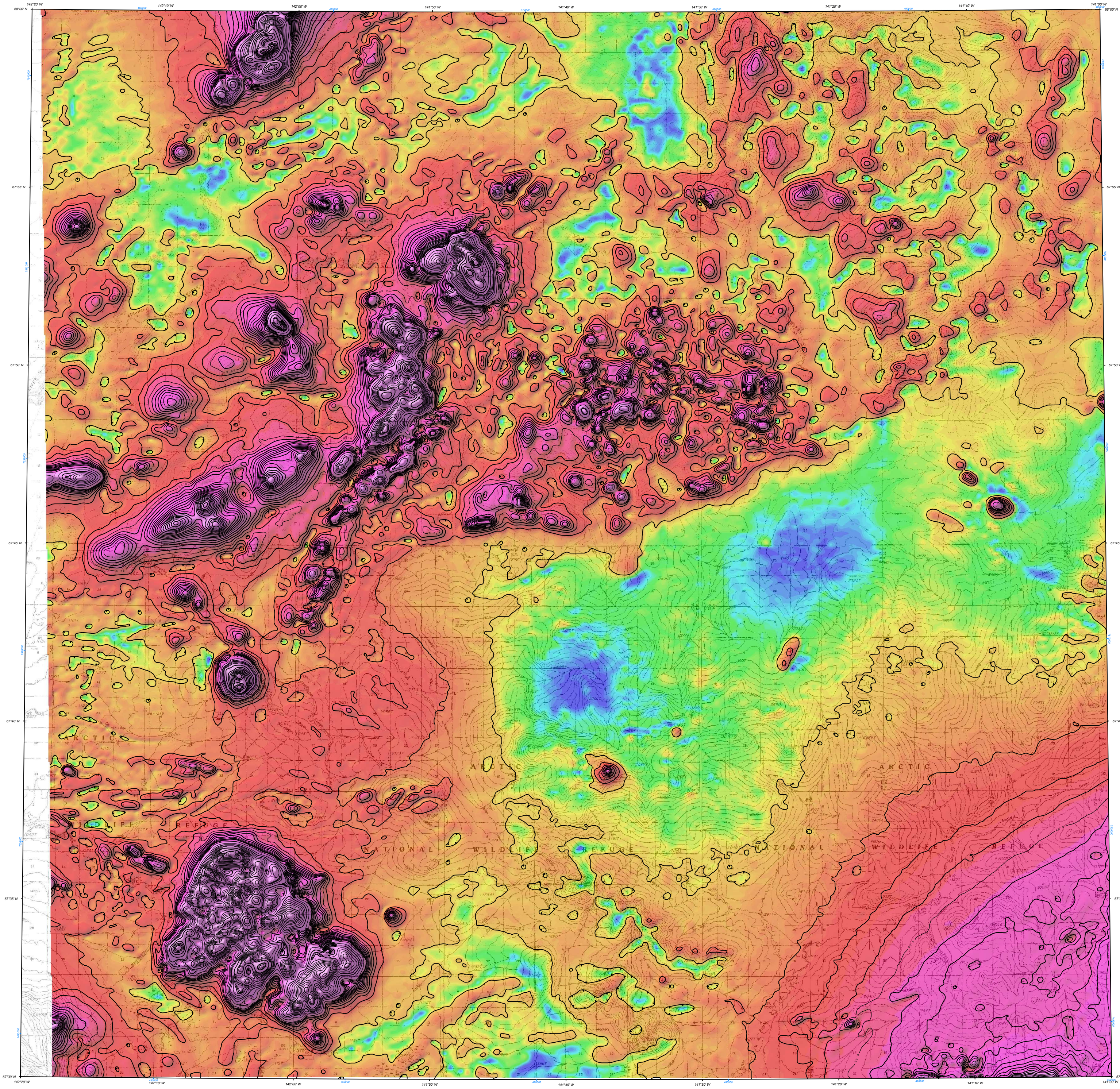
GEOPHYSICAL REPORT 2019-1
Analytic signal grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



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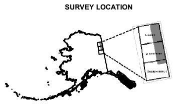

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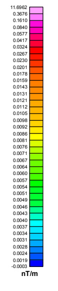
ANALYTIC SIGNAL GRID AND CONTOURS

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019



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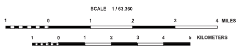
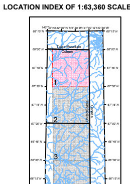


LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by EON Geosciences Inc. from May 5 to June 28, 2017 using a Piper PA-31 Navajo aircraft (registration C-FION). The magnetic data were recorded at 10 Hz using a Geometrics G-822A caesium vapour magnetometer mounted in the tail boom of the aircraft. GNSS positioning data were recorded at 1 Hz using a NovAtel DL-V3 GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

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GEOPHYSICAL REPORT 2019-1
Analytic signal grid and contours; scale 1:63,360; Sheet 2 of 4
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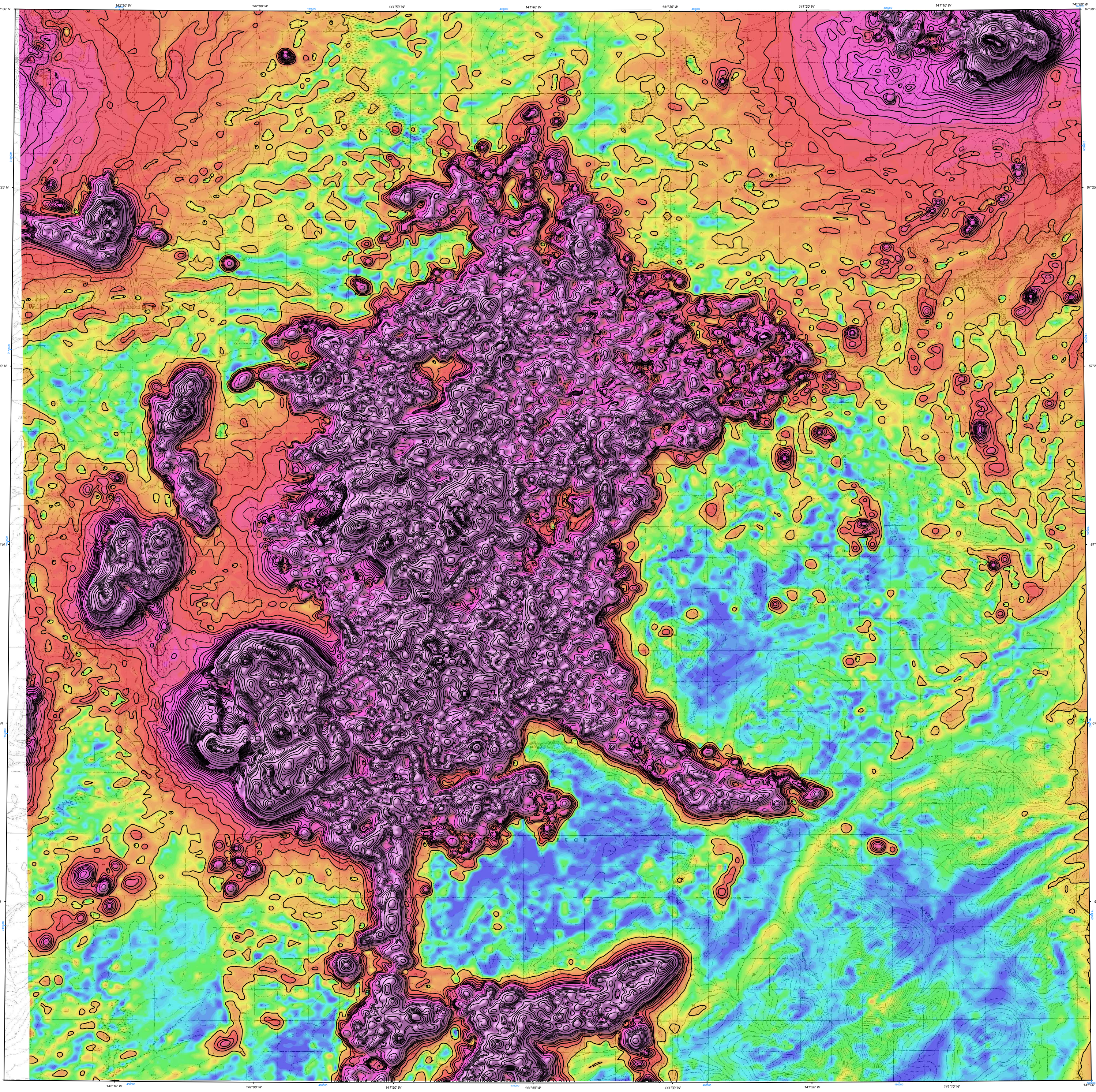

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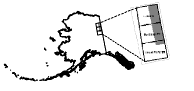

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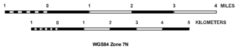

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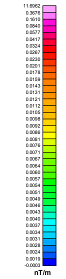
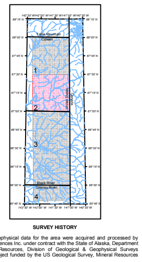


LOCATION INDEX OF 1:63,360 SCALE MAP



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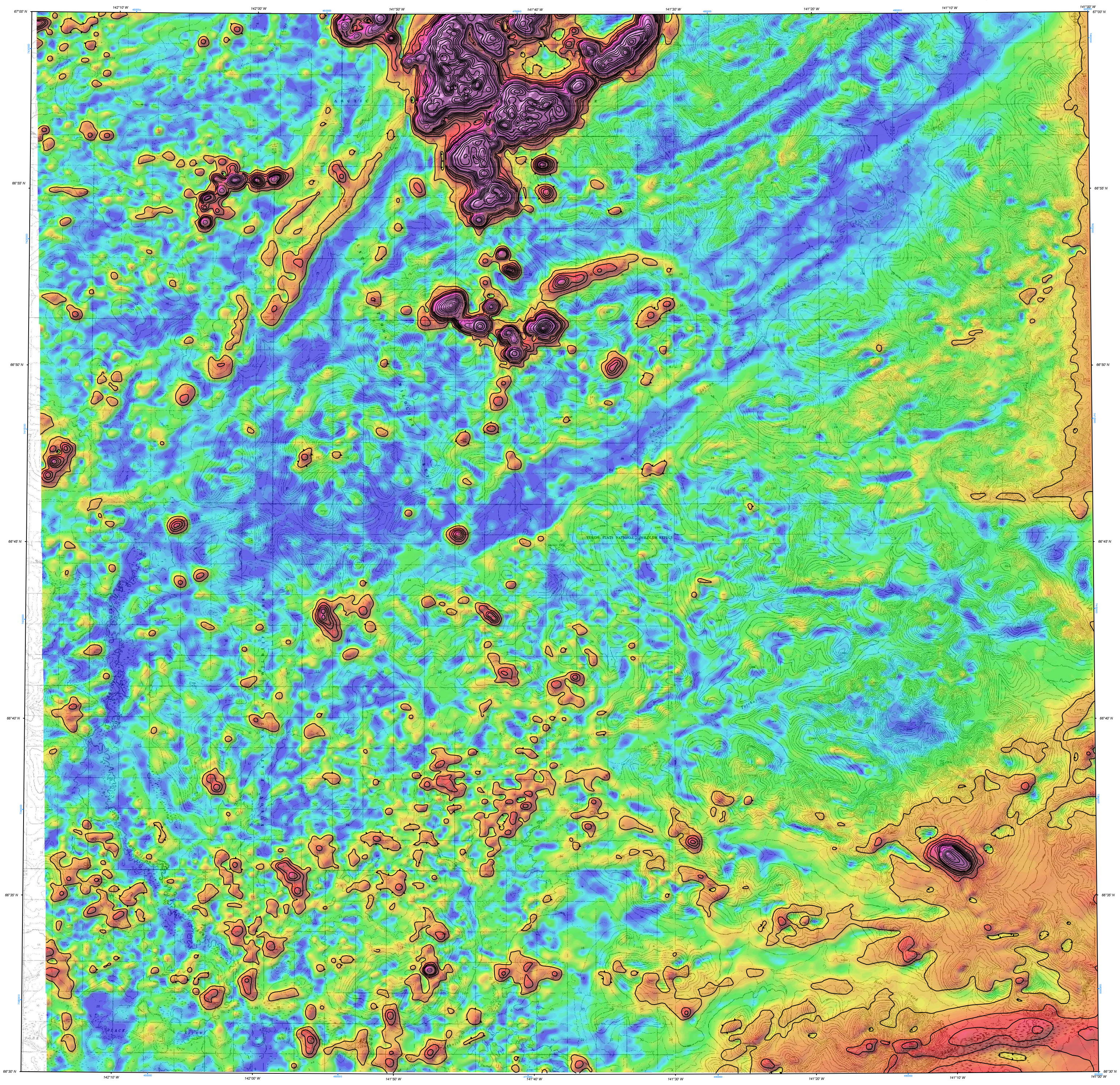
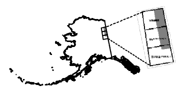
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Analytic signal grid and contours; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



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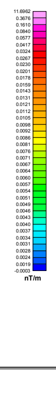
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

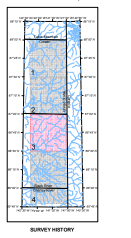
1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

CONTOUR LEGEND



LOCATION INDEX OF 1:63,360 SCALE MAP



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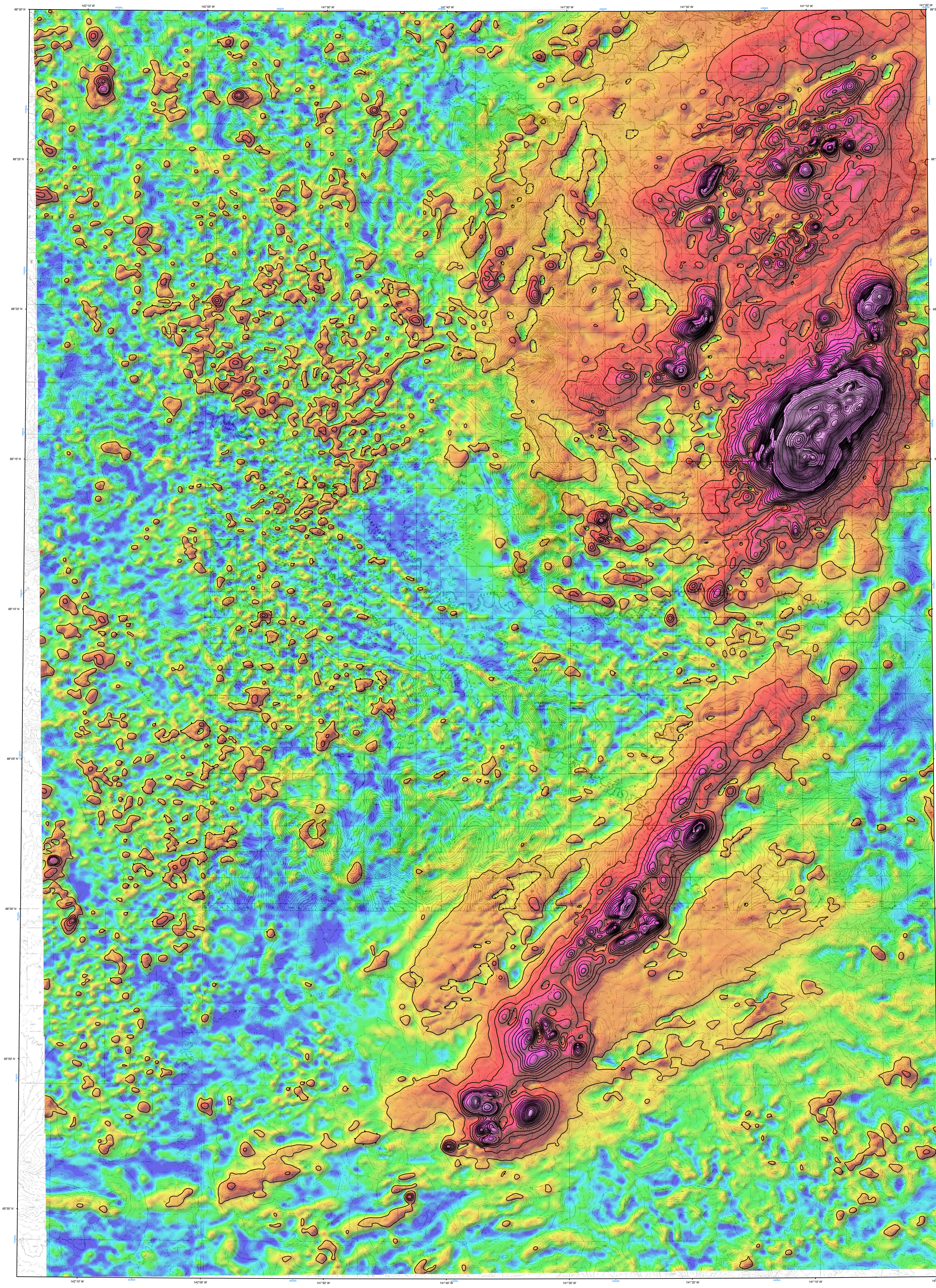
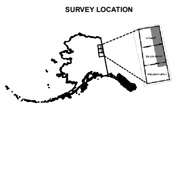
Analytic signal grid and contours; scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

ANALYTIC SIGNAL GRID AND CONTOURS

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

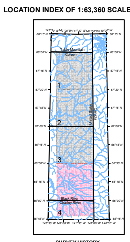
WGS84 Zone 7N

CONTOUR LEGEND

1 nT/m
0.25 nT/m
0.05 nT/m
0.01 nT/m
Low

11.6962
0.3676
0.1610
0.0840
0.0577
0.0417
0.0324
0.0267
0.0230
0.0201
0.0178
0.0159
0.0143
0.0131
0.0121
0.0112
0.0105
0.0098
0.0092
0.0086
0.0081
0.0076
0.0071
0.0067
0.0064
0.0060
0.0057
0.0054
0.0051
0.0049
0.0046
0.0043
0.0040
0.0037
0.0034
0.0031
0.0028
0.0024
0.0019
-0.0003
nT/m

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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The nominal traverse and control line separations were, respectively, 300 m and 3000 m. Traverse lines were oriented N0°E with orthogonal control lines. The aircraft flew a predetermined drape surface calculated with a nominal terrain clearance of 100 m, resulting in an average terrain clearance of 233 m.

ANALYTIC SIGNAL OF THE MAGNETIC FIELD

The analytic signal of the magnetic field is the total amplitude of the vector sum of the horizontal and vertical magnetic gradients. Computation of the analytic signal enhances the boundaries of magnetic anomalies and is independent of direction of magnetization. The data presented here were calculated from the residual magnetic intensity grid by: (1) computation of the total magnitude of the components obtained from the application of horizontal and FFT-based vertical derivative transfer functions, and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

SURVEY HISTORY

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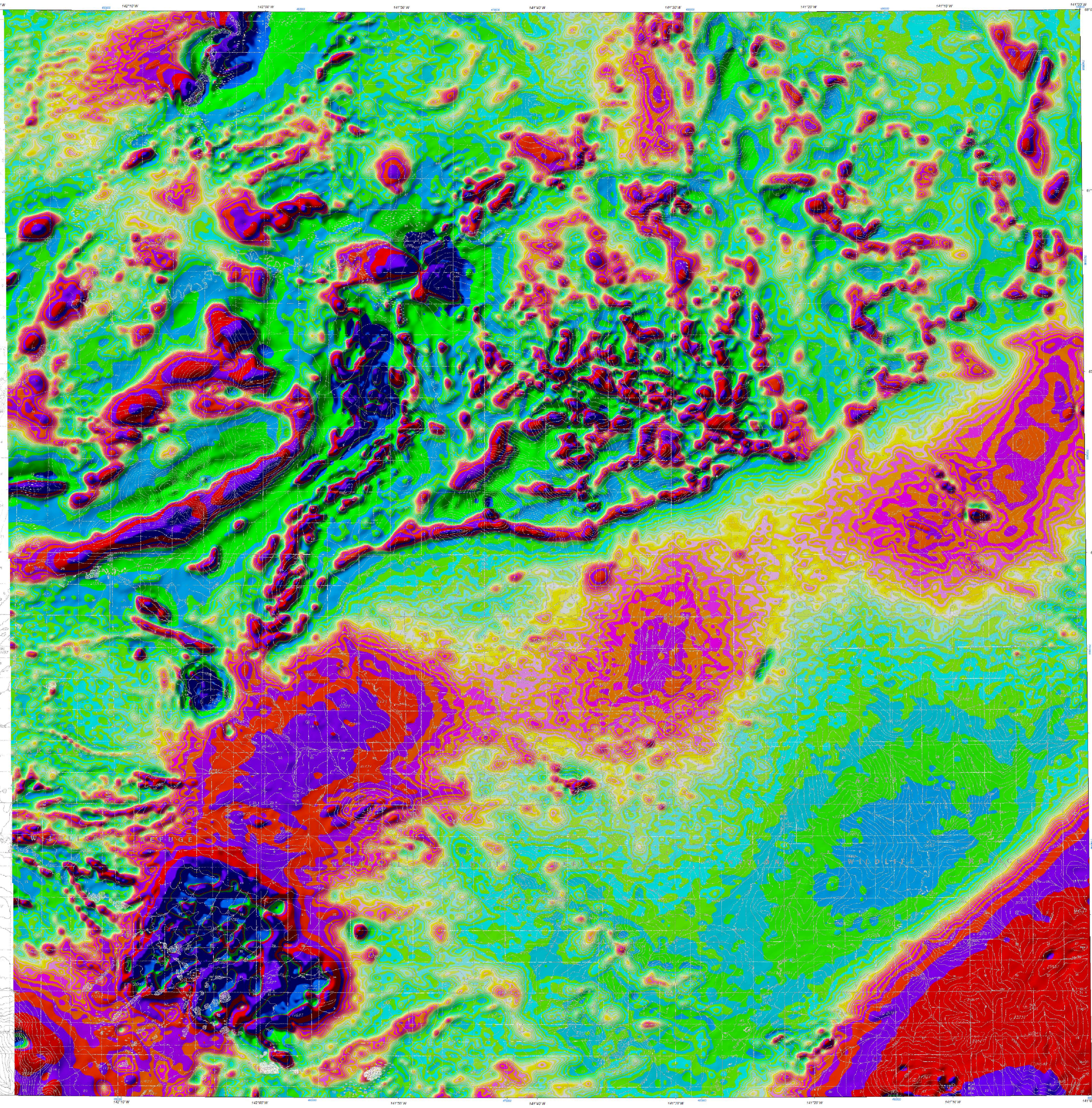
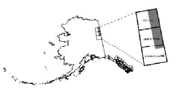
GEOPHYSICAL REPORT 2017-2
Analytic signal grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION

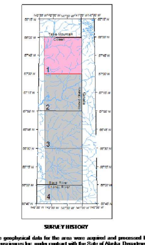


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED FIRST VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative enhances shorter wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by: (1) application of an FFT-based vertical derivative transfer function and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

SURVEY HISTORY

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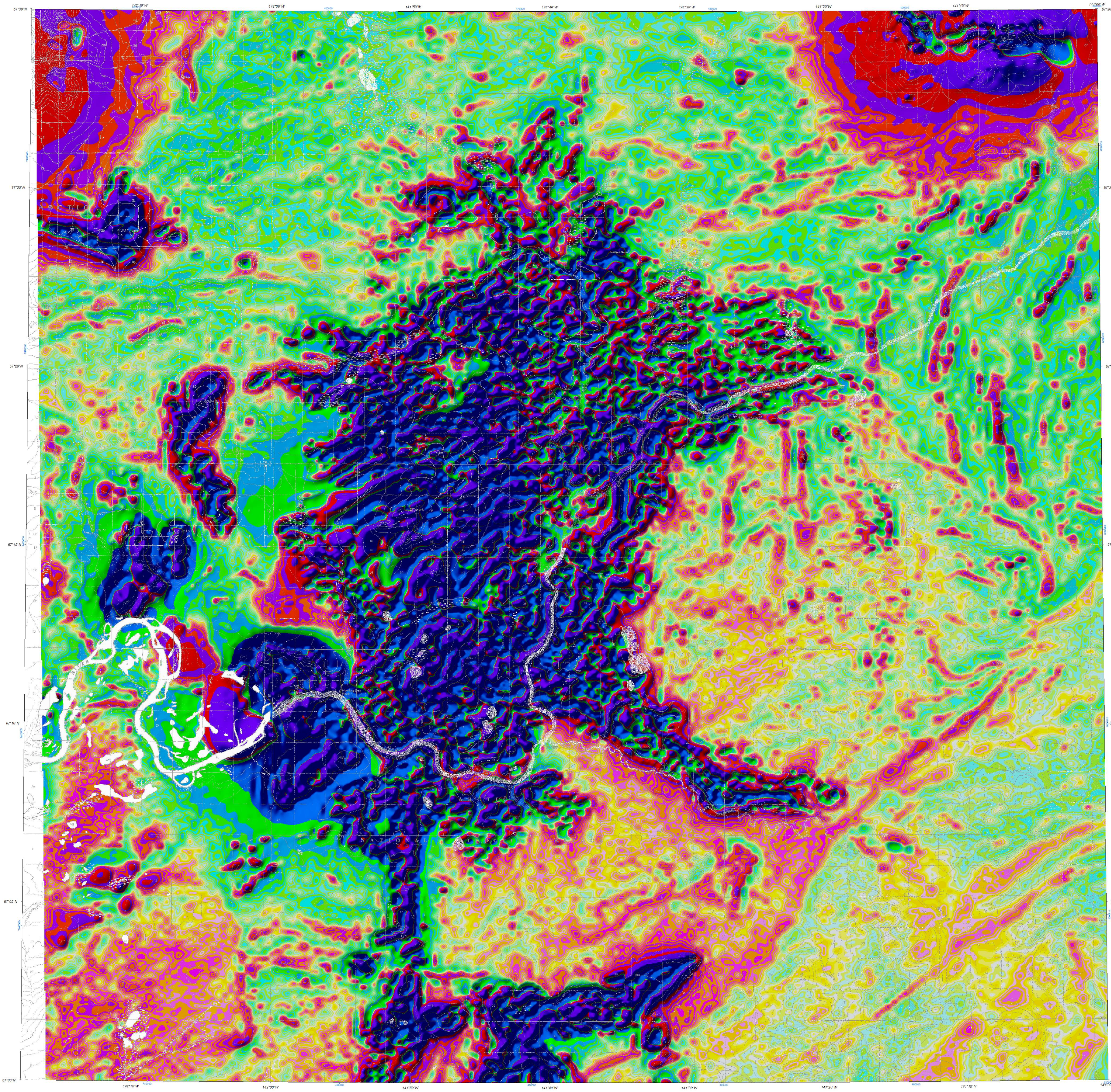
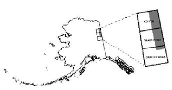
GEOPHYSICAL REPORT 2017-2
Calculated first vertical derivative grid; scale 1:63,360; Sheet 2 of 4
Quadrangles: Coleen A-1, A-2, A-3, B-1, B-2, B-3



SURVEY LOCATION

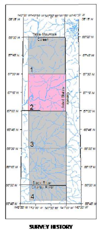


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED FIRST VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

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SURVEY HISTORY

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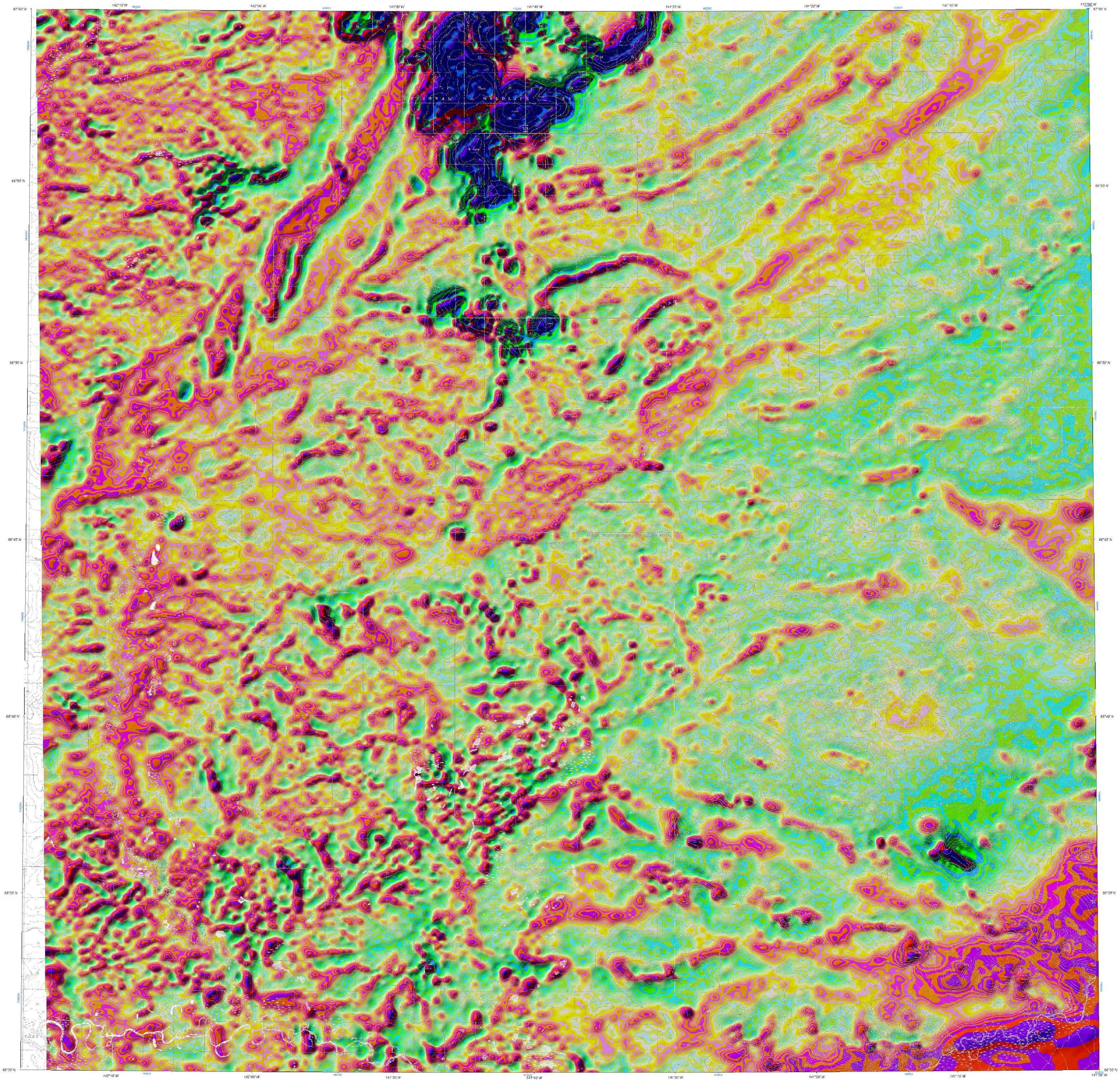
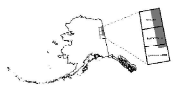
GEOPHYSICAL REPORT 2017-2
Calculated first vertical derivative grid; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION

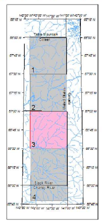


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED FIRST VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

LOCATION INDEX OF 1:63,360 SCALE MAP



nT/m

DESCRIPTIVE NOTES

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SCALE 1:63,360

MILES

KILOMETERS

WGS84 Zone 7N

SURVEY HISTORY

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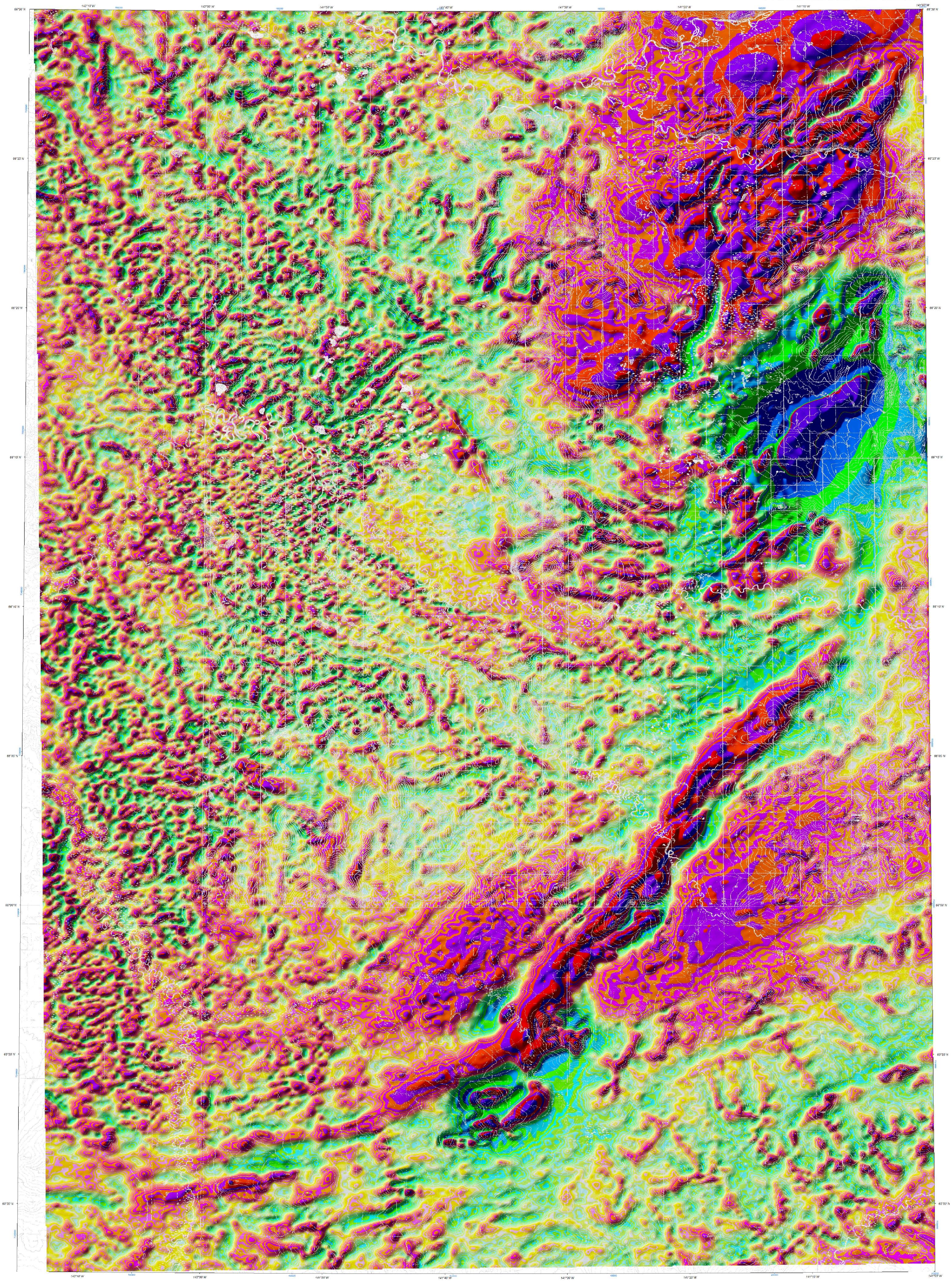
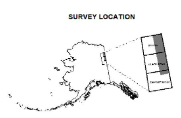
GEOPHYSICAL REPORT 2017-2
Calculated first vertical derivative grid; scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED FIRST VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

SCALE 1:63,360

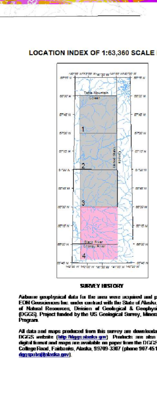
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

5.2615
0.0943
0.0379
0.0204
0.0129
0.0088
0.0064
0.0047
0.0035
0.0026
0.0019
0.0011
0.0005
0.0000
-0.0005
-0.0009
-0.0013
-0.0017
-0.0020
-0.0024
-0.0027
-0.0031
-0.0034
-0.0038
-0.0042
-0.0046
-0.0050
-0.0054
-0.0059
-0.0065
-0.0071
-0.0079
-0.0089
-0.0101
-0.0116
-0.0137
-0.0176
-0.0289
-0.0849
-10.0394
nT/m

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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SURVEY HISTORY

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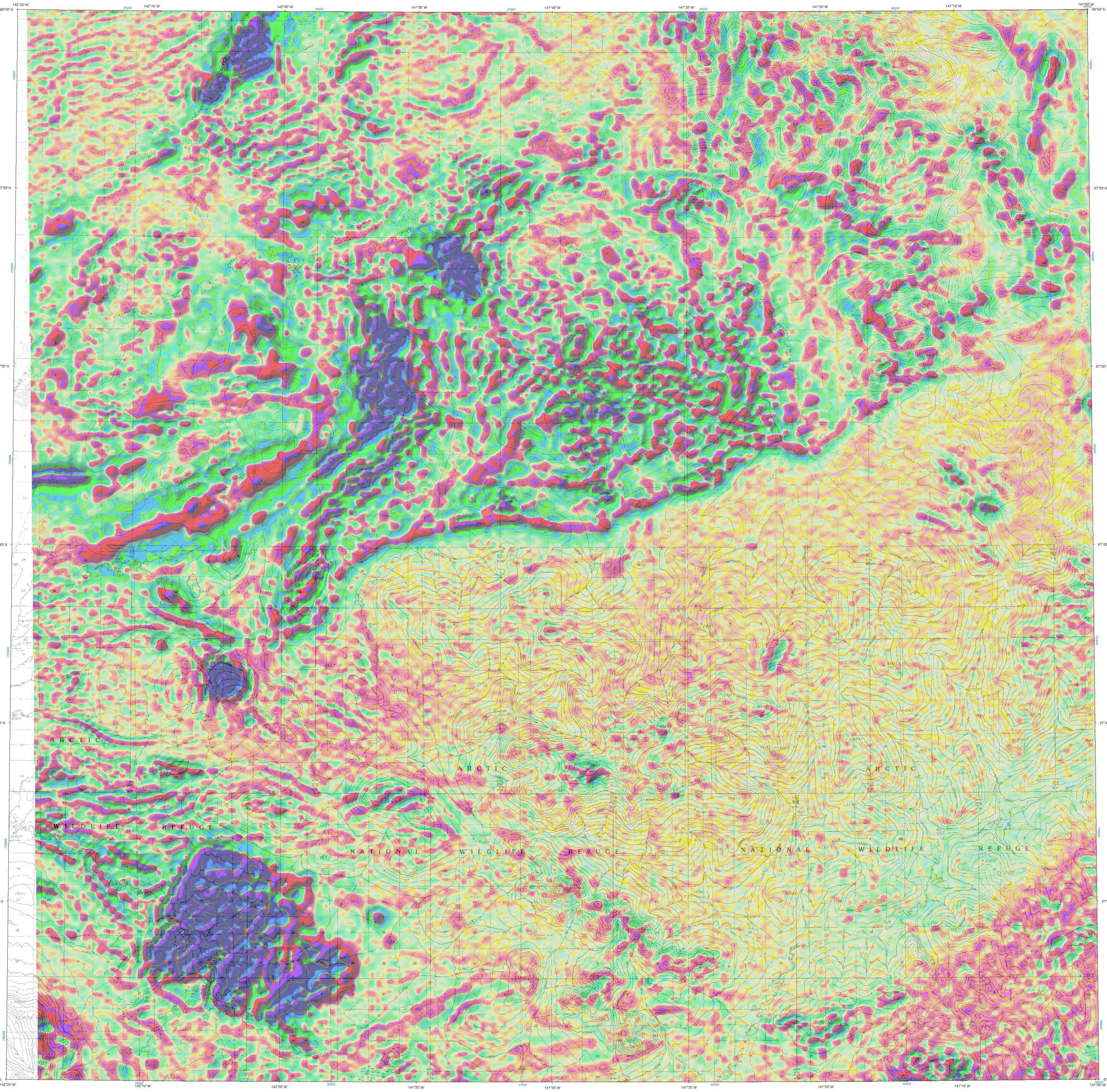
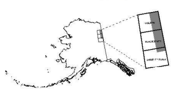
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Analytic signal grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



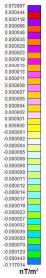
SURVEY LOCATION



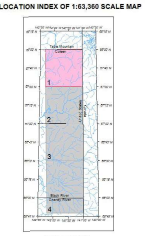
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019



LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

DESCRIPTIVE NOTES

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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

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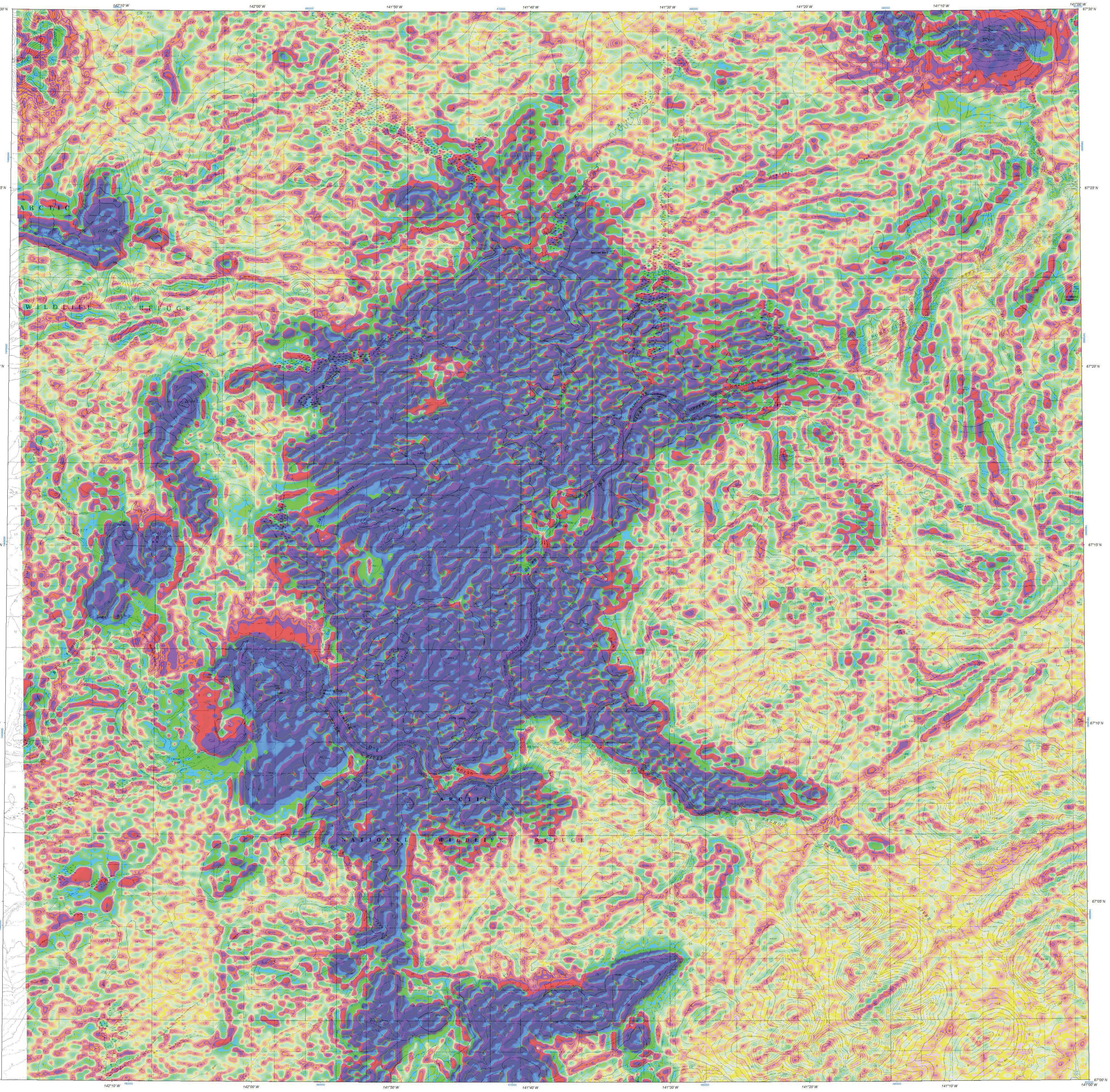
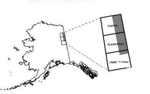


SURVEY LOCATION



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CALCULATED SECOND VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
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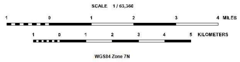
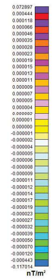
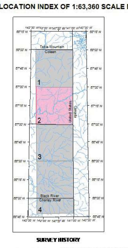




nT/m²

LOCATION INDEX OF 1:63,360 SCALE MAP



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The second vertical derivative of the magnetic field is the curvature of the magnetic field with respect to the vertical direction. Computation of the second vertical derivative enhances shorter wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by: (1) application of an FFT-based vertical derivative transfer function and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

SURVEY HISTORY

Airborne geophysical data for the area were acquired and processed by EON Geosciences Inc. under contract with the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS). Project funded by the US Geological Survey, Mineral Resources Program.

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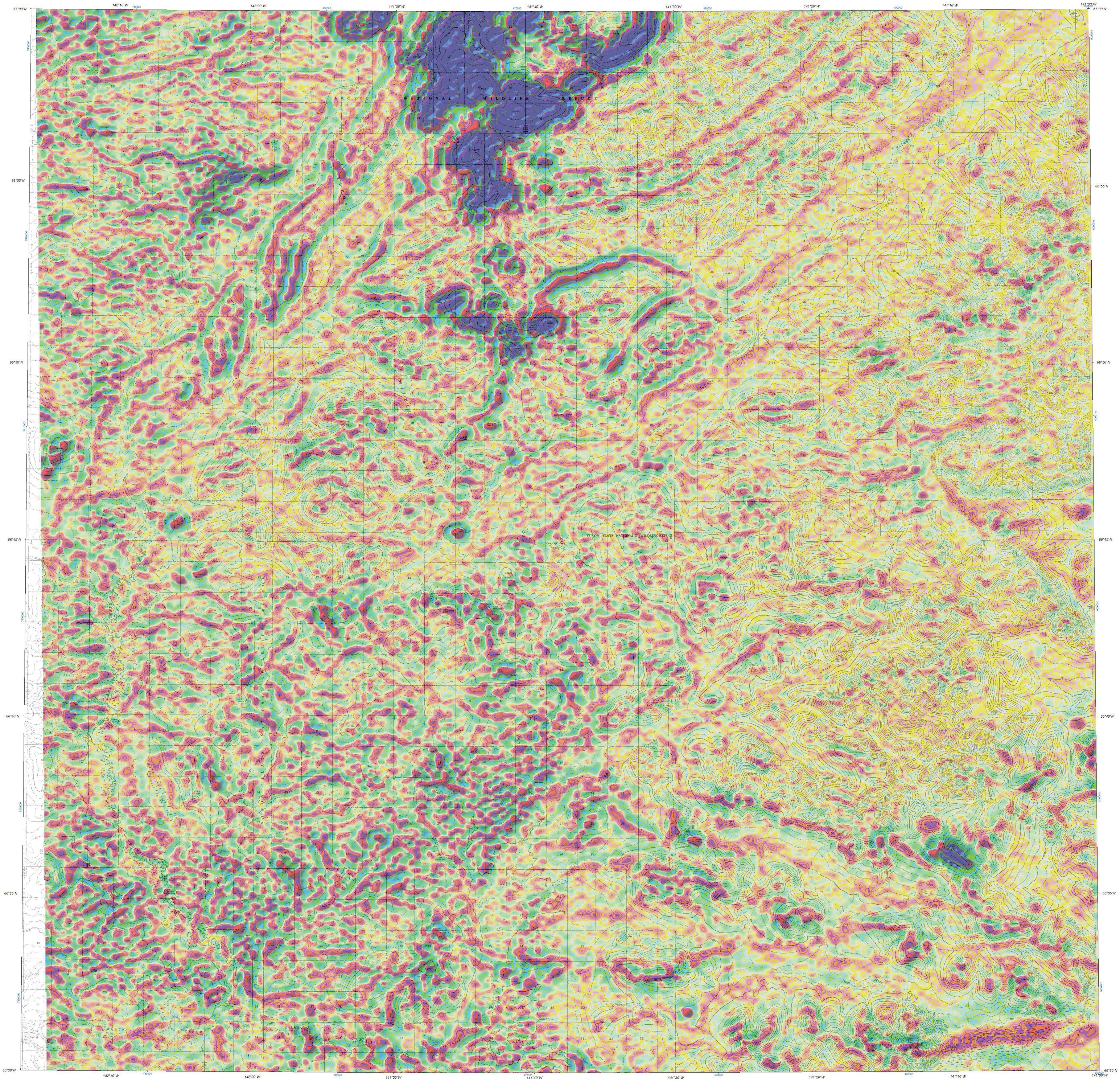
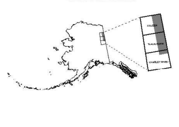
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Calculated second vertical derivative grid; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



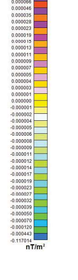
SURVEY LOCATION



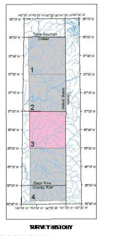
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019



LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by EON Geosciences Inc. from May 5 to June 28, 2017 using a Piper PA-31 Navajo aircraft (registration C-FION). The magnetic data were recorded at 10 Hz using a Geometrics G-822A caesium vapour magnetometer mounted in the tail boom of the aircraft. GNSS positioning data were recorded at 1 Hz using a NovAtel DL-V3 GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

The nominal traverse and control line separations were, respectively, 300 m and 3000 m. Traverse lines were oriented N0°E with orthogonal control lines. The aircraft flew a predetermined drape surface calculated with a nominal terrain clearance of 100 m, resulting in an average terrain clearance of 233 m.

CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The second vertical derivative of the magnetic field is the curvature of the magnetic field with respect to the vertical direction. Computation of the second vertical derivative enhances shorter wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by: (1) application of an FFT-based vertical derivative transfer function and (2) sampling this initial grid back into the line database and re-gridding the sampled data in order to attenuate the artefacts generated between traverse lines during gridding and FFT computations.

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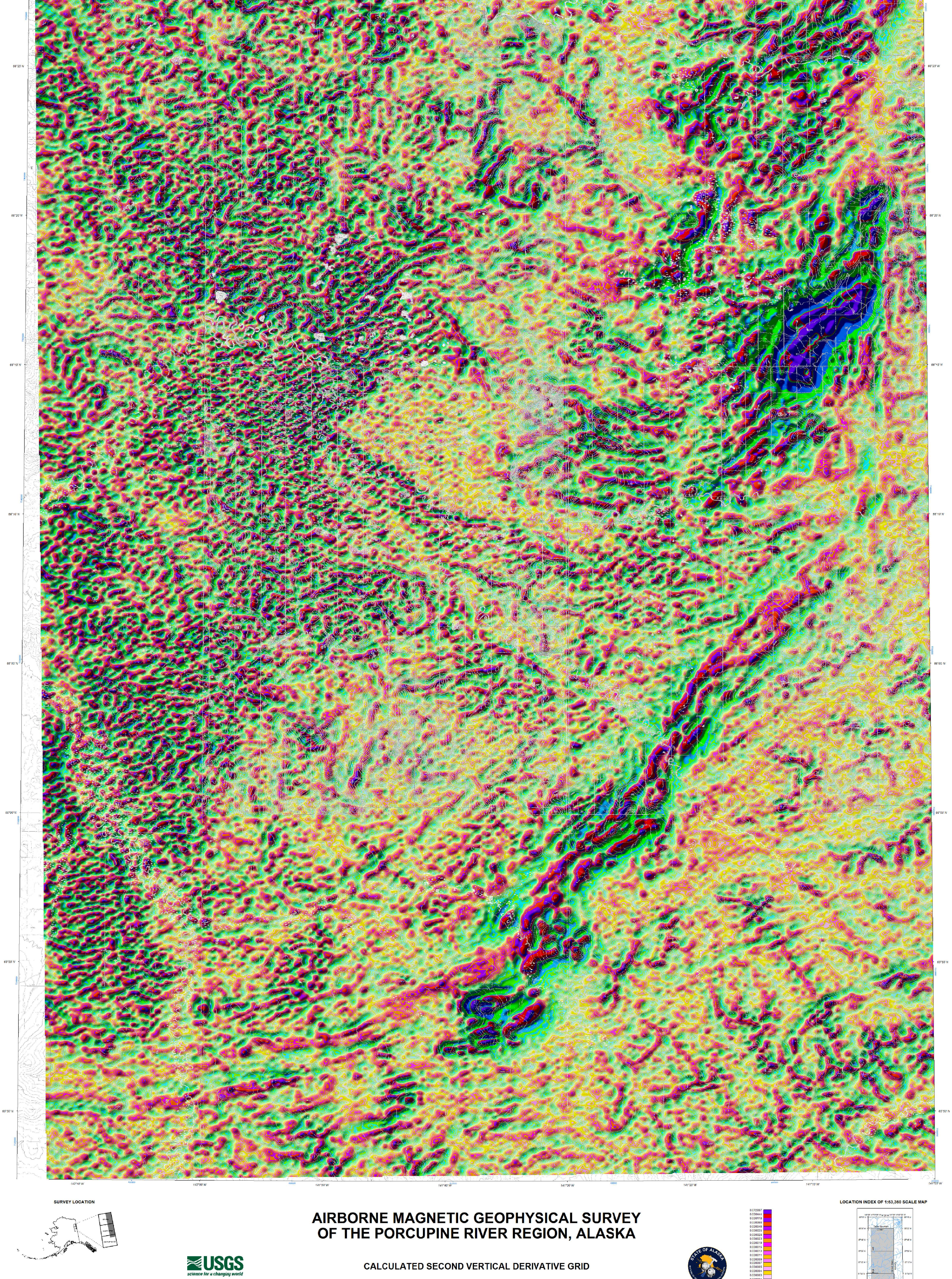
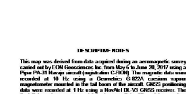
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Calculated second vertical derivative grid; scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID

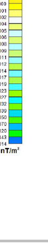
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

SCALE 1:63,360

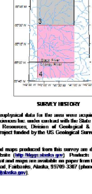
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

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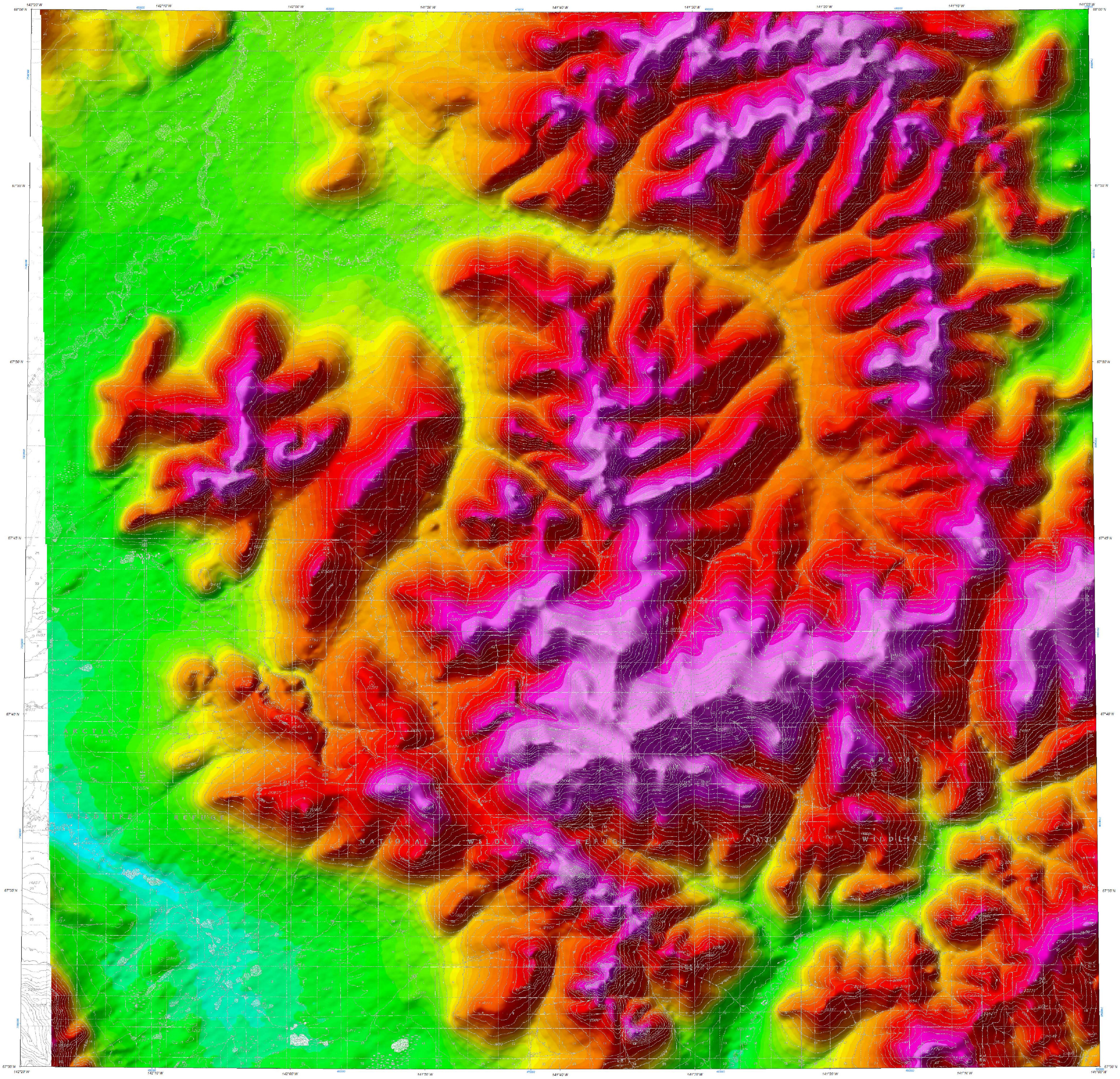
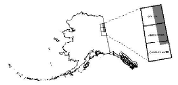
GEOPHYSICAL REPORT 2017-2
Analytic signal grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



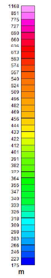
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

DIGITAL TERRAIN MODEL GRID

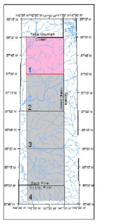
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

SCALE 1:63,360

WGS84 Zone 7N



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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DIGITAL TERRAIN MODEL

The digital terrain model is the terrain elevation derived from recorded altimetry data. The data presented here were calculated using the final GPS aircraft elevation and the final edited radar altitude above ground level (AGL), taking into account the 2.5 m vertical separation of the GPS antenna above the radar transducer. The final digital terrain model was then gridded at a cell size of 60 m, using data from the traverse lines only.

The final edited radar AGL altitude data were derived from the recorded radar data by: (1) application of a lag to compensate for system latency and (2) edition and levelling of the raw digital terrain model (DTM) in order to correct radar data against discrete spikes caused by poor reflection over steeper terrain, drift, and instrumental high-frequency noise.

SURVEY HISTORY

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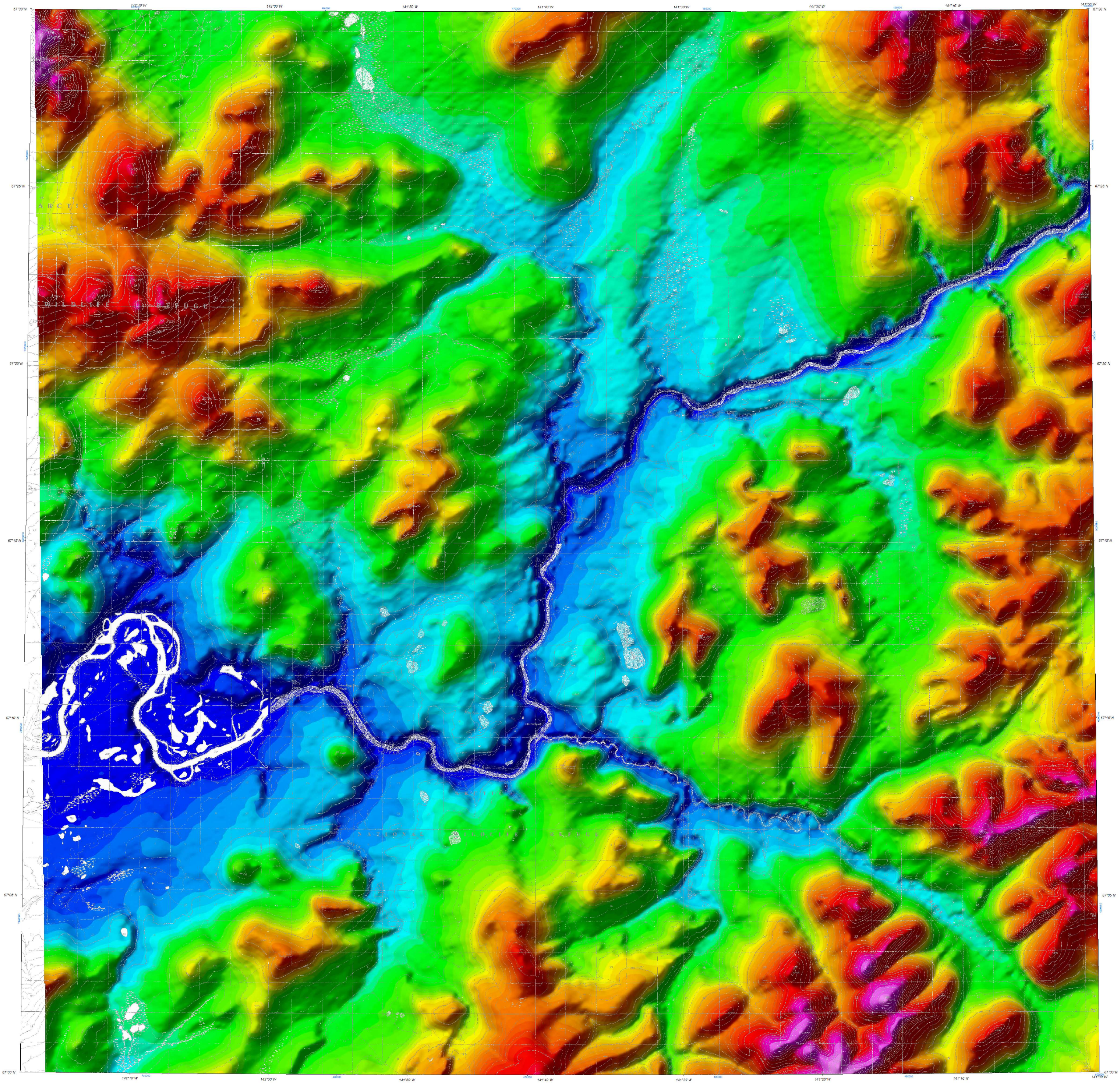
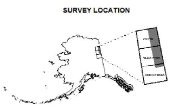


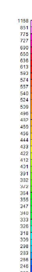
SURVEY LOCATION



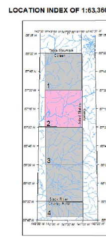
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

DIGITAL TERRAIN MODEL GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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The final edited radar AGL altitude data were derived from the recorded radar data by: (1) application of a lag to compensate for system latency and (2) edition and levelling of the raw digital terrain model (DTM) in order to correct radar data against discrete spikes caused by poor reflection over steeper terrain, drift, and instrumental high-frequency noise.

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

SURVEY HISTORY

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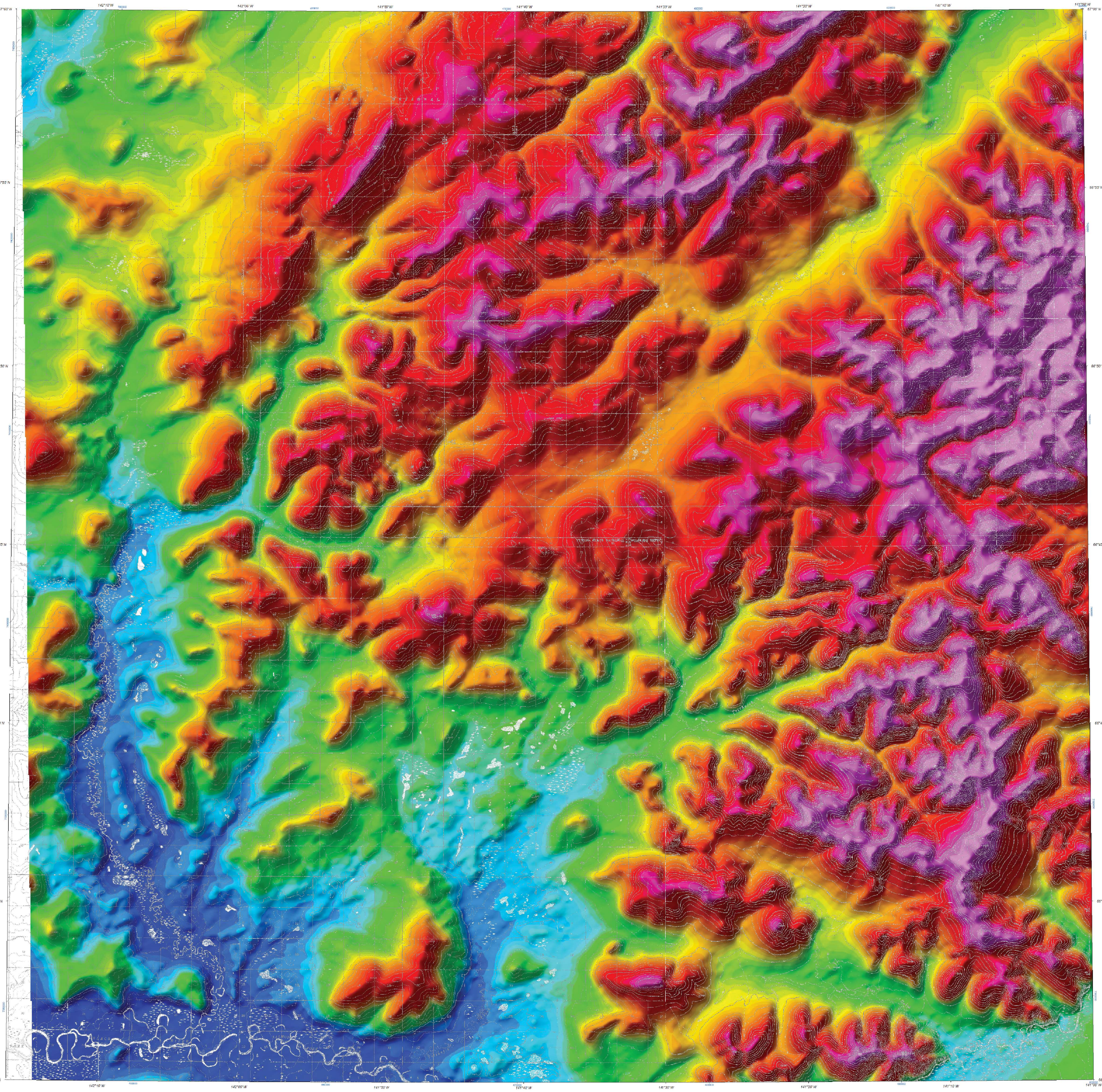
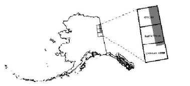
GEOPHYSICAL REPORT 2017-2
Digital terrain model grid; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



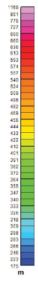
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

DIGITAL TERRAIN MODEL GRID

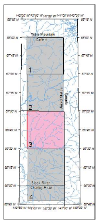
http://doi.org/10.14509/29737

by EON Geosciences Inc.

2017



LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1:63,360

MILES

KILOMETERS

WGS84 Zone 7N

DESCRIPTIVE NOTES

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DIGITAL TERRAIN MODEL

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SURVEY HISTORY

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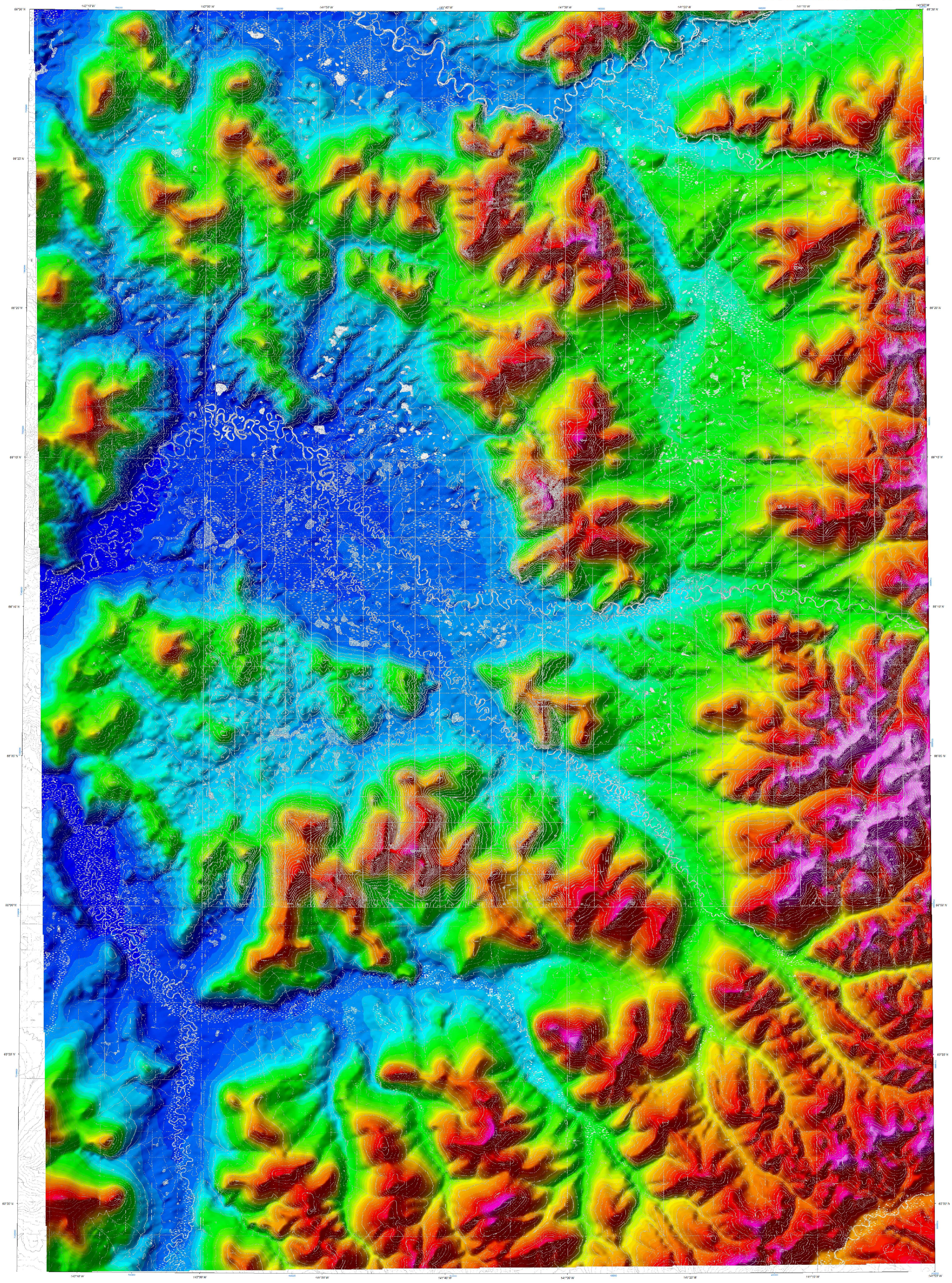
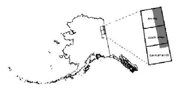
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2017-2
Digital terrain model grid: scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

DIGITAL TERRAIN MODEL GRID

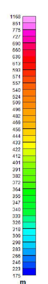
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

SCALE 1:63,360

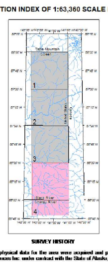
0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N



LOCATION INDEX OF 1:63,360 SCALE MAP



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DIGITAL TERRAIN MODEL

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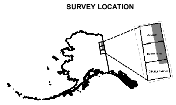
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Flightlines; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3

SURVEY LOCATION

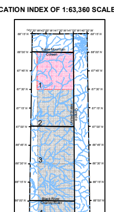


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

FLIGHTLINES

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

DESCRIPTIVE NOTES

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SURVEY HISTORY

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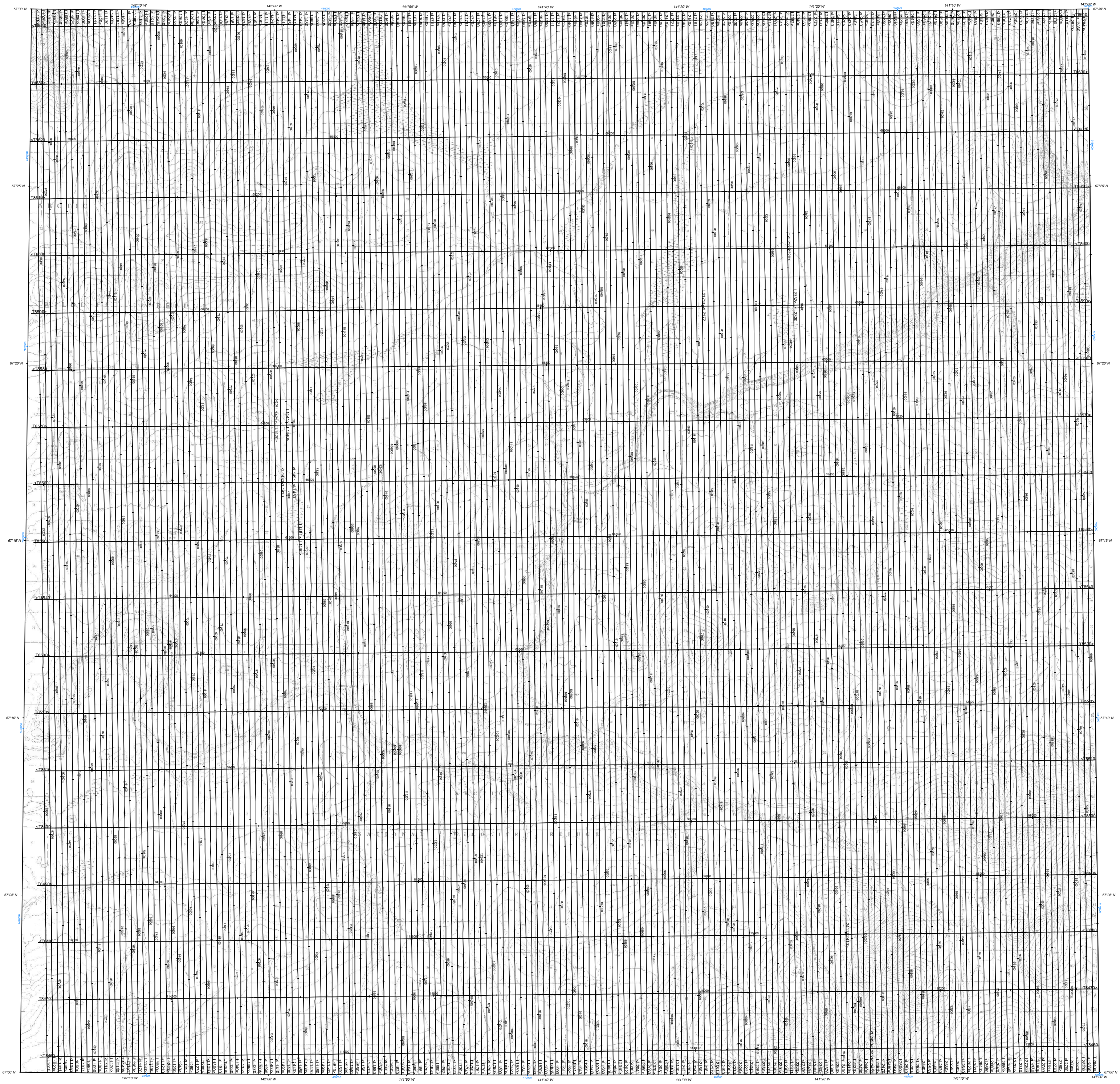
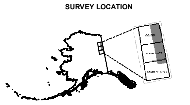
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Flightlines; scale 1:63,360; Sheet 2 of 4
Quadrangles: Coleen A-1, A-2, A-3, B-1, B-2, B-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

FLIGHTLINES

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

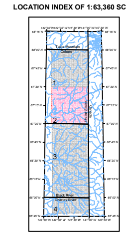
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by EON Geosciences Inc. from May 5 to June 28, 2017 using a Piper PA-31 Navajo aircraft (registration C-FION). The magnetic data were recorded at 10 Hz using a Geometrics G-822A caesium vapour magnetometer mounted in the tail boom of the aircraft. GNSS positioning data were recorded at 1 Hz using a NovAtel DL-V3 GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

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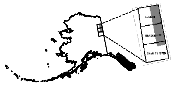
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Flightlines; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3

SURVEY LOCATION



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FLIGHTLINES

http://doi.org/10.14509/29737
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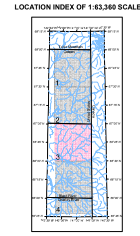
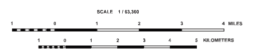
2019

LOCATION INDEX OF 1:63,360 SCALE MAP





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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Flightlines; scale 1:63,360. Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3

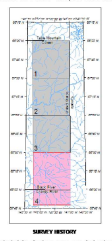
SURVEY LOCATION

AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

FLIGHTLINES

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

LOCATION INDEX OF 1:63,360 SCALE MAP



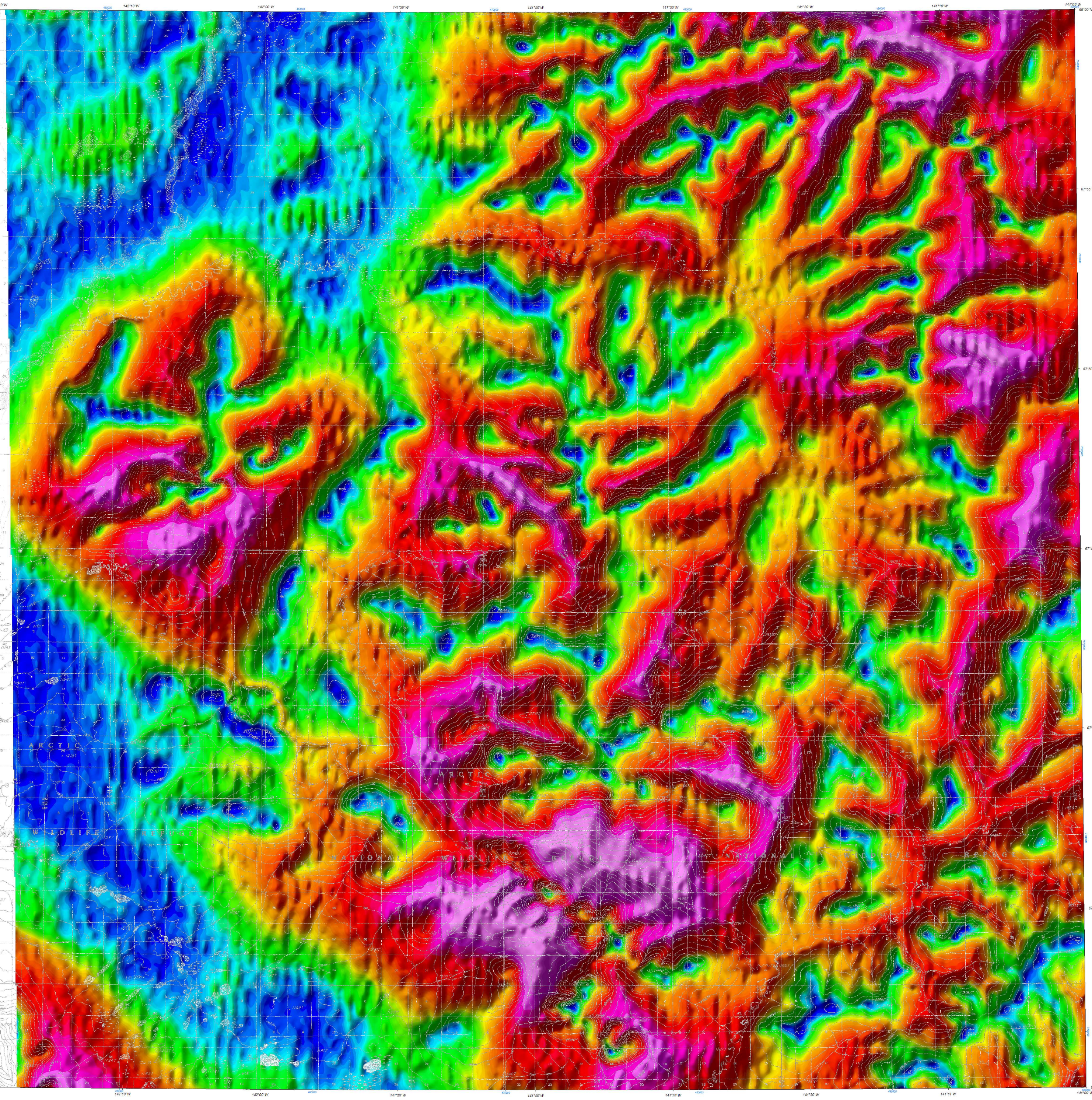
SURVEY HISTORY

DESCRIPTIVE NOTES

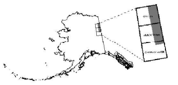
SCALE 1:63,360

WGS84 Zone 7N

GEOPHYSICAL REPORT 2017-2
Ground clearance grid; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION

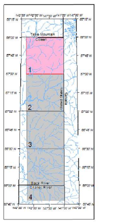


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

GROUND CLEARANCE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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GROUND CLEARANCE OF THE MAGNETIC TOTAL FIELD SENSOR

The ground clearance of the magnetic total field sensor is its altitude above ground level (AGL). The data presented here were calculated from the final edited radar AGL altitude by adding the 2.5 m vertical separation of the magnetic sensor above the radar transducer. The final ground clearance was then gridded at a cell size of 60 m, using data from the traverse lines only.

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SCALE 1:63,360

WGS84 Zone 7N

SURVEY HISTORY

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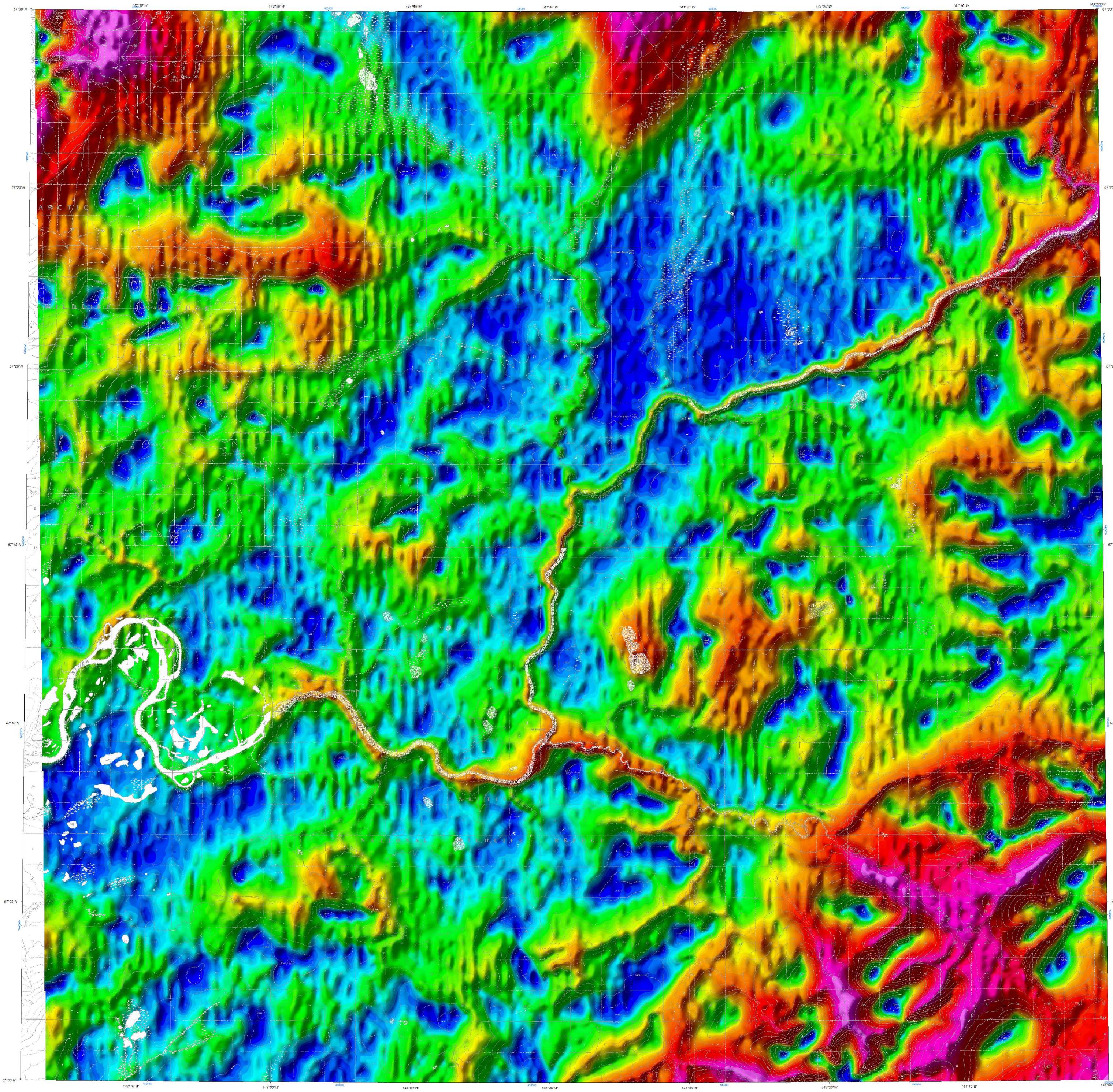
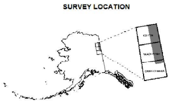
GEOPHYSICAL REPORT 2017-2
Ground clearance grid; scale 1:63,360; Sheet 2 of 4
Quadrangles: Coleen A-1, A-2, A-3, B-1, B-2, B-3



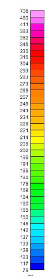
SURVEY LOCATION



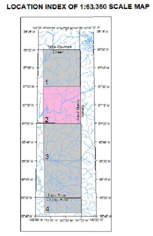
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

GROUND CLEARANCE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017



LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1:63,360

WGS84 Zone 7N

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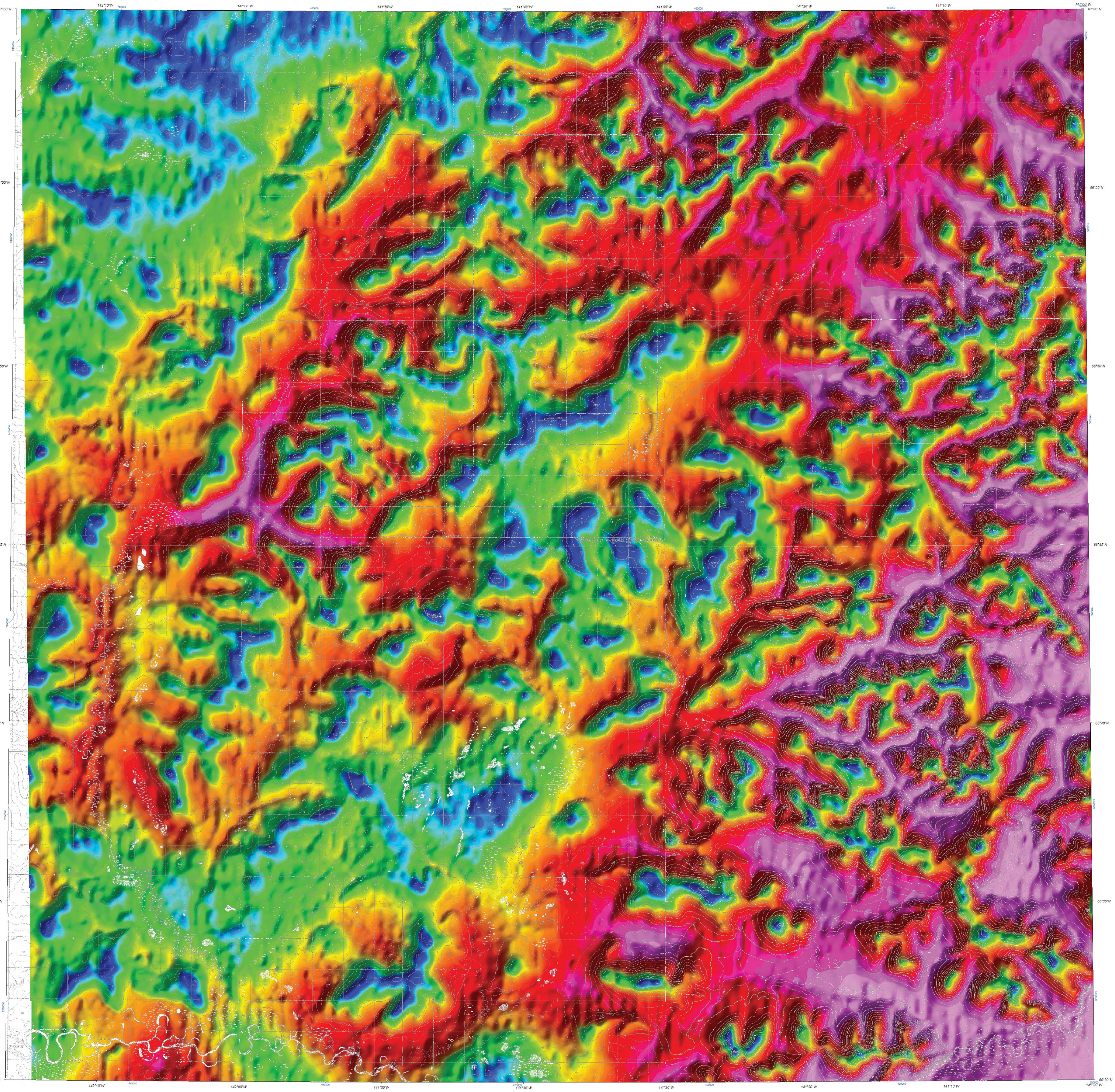
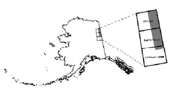
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2017-2
Ground clearance grid; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



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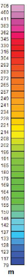
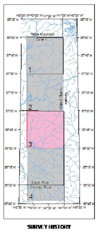
GROUND CLEARANCE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017



LOCATION INDEX OF 1:63,360 SCALE MAP



SCALE 1:63,360

WGS84 Zone 7N

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GEOPHYSICAL REPORT 2017-2
Ground clearance grid; scale 1:63,360; Sheet 4 of 4
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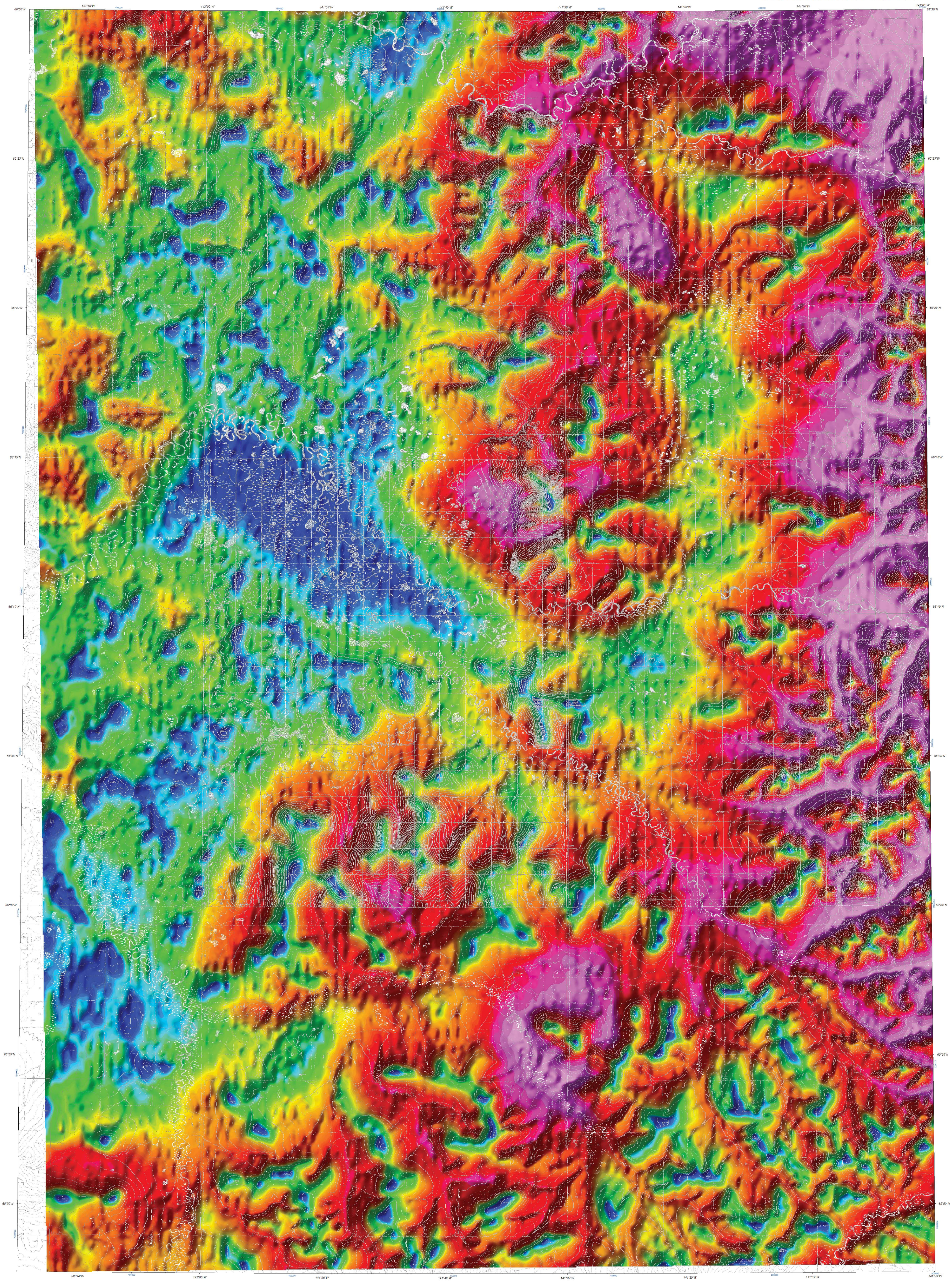

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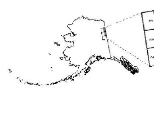


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

GROUND CLEARANCE GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2017

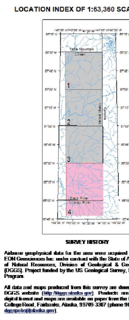
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



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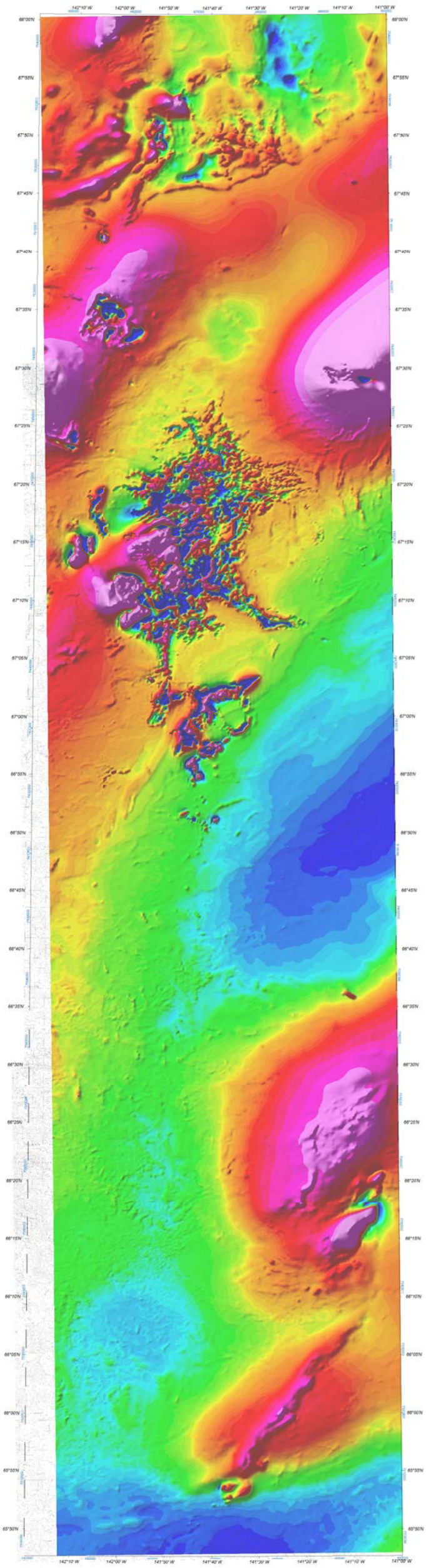
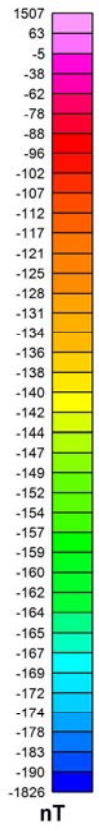
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Residual Magnetic Intensity grid and contours; scale 1:250,000





DESCRIPTIVE NOTES

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RESIDUAL MAGNETIC INTENSITY

The residual magnetic field represents the component of the total magnetic field related almost entirely to the magnetic properties of the Earth's crust. The data presented here were derived from the recorded data by: (1) application of a lag to compensate for system latency, (2) correction against discrete spikes and high-frequency residual compensation noise, (3) application of a height correction derived from the International Geomagnetic Reference Field (IGRF) computed for flight and drape surfaces, (4) application of a diurnal correction derived from the magnetic base station data, (5) analysis of the remaining differences between the traverse and control line values at the intersection points to obtain a correction profile that results in mutually levelled line data, (6) application of a micro-levelling correction to further reduce residual noise, and (7) removal of the IGRF values defined at the average mean sea-level height of 690.0 m for a fixed date of June 1st 2017 to obtain the residual magnetic intensity. The final residual magnetic field was then gridded at a cell size of 60 m, using data from the traverse lines only.

SURVEY HISTORY

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SURVEY LOCATION

AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

RESIDUAL MAGNETIC INTENSITY GRID

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

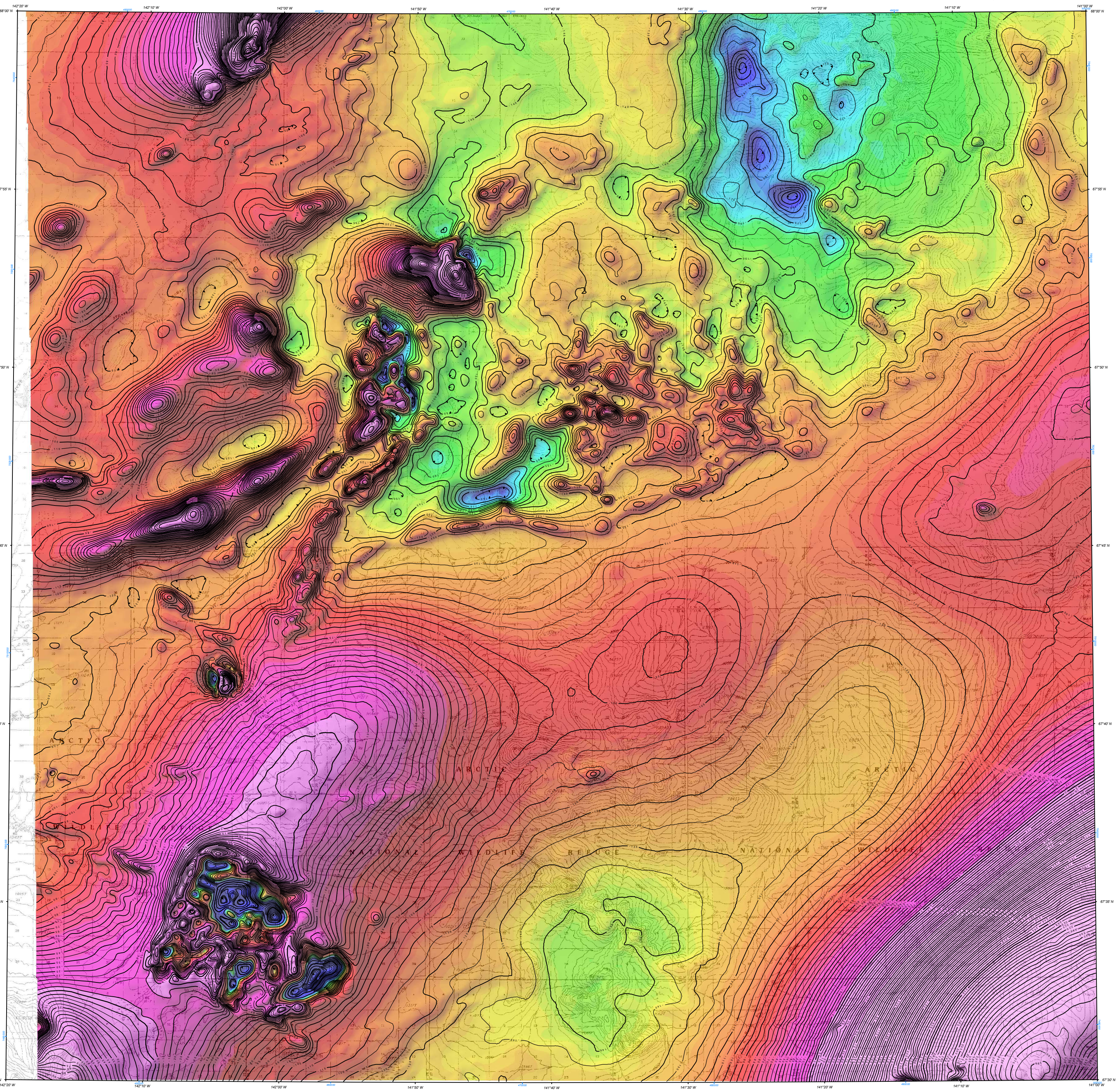
USGS science for a changing world

SCALE 1 / 63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
WGS84 Zone 7N

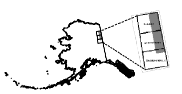
STATE OF ALASKA

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Residual magnetic intensity grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

RESIDUAL MAGNETIC INTENSITY GRID AND CONTOURS

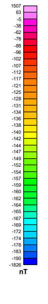
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

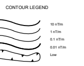
SCALE 1:63,360

MILES

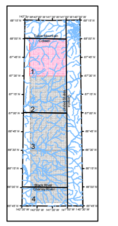
KILOMETERS

WGS84 Zone 7N





LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by EON Geosciences Inc. from May 5 to June 28, 2017 using a Piper PA-31 Navajo aircraft (registration C-FION). The magnetic data were recorded at 10 Hz using a Geometrics G-822A caesium vapour magnetometer mounted in the tail boom of the aircraft. GNSS positioning data were recorded at 1 Hz using a NovAtel DL-V3 GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

The nominal traverse and control line separations were, respectively, 300 m and 3000 m. Traverse lines were oriented N0°E with orthogonal control lines. The aircraft flew a predetermined drape surface calculated with a nominal terrain clearance of 100 m, resulting in an average terrain clearance of 233 m.

RESIDUAL MAGNETIC INTENSITY

The residual magnetic field represents the component of the total magnetic field related almost entirely to the magnetic properties of the Earth's crust. The data presented here were derived from the recorded data by: (1) application of a lag to compensate for system latency, (2) correction against discrete spikes and high-frequency residual compensation noise, (3) application of a height correction derived from the International Geomagnetic Reference Field (IGRF) computed for flight and drape surfaces, (4) application of a diurnal correction derived from the magnetic base station data, (5) analysis of the remaining differences between the traverse and control line values at the intersection points to obtain a correction profile that results in mutually levelled line data, (6) application of a micro-levelling correction to further reduce residual noise, and (7) removal of the IGRF values defined at the average mean sea-level height of 690.0 m for a fixed date of June 1st 2017 to obtain the residual magnetic intensity. The final residual magnetic field was then gridded at a cell size of 60 m, using data from the traverse lines only.

SURVEY HISTORY

Airborne geophysical data for the area were acquired and processed by EON Geosciences Inc. under contract with the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS). Project funded by the US Geological Survey, Mineral Resources Program.

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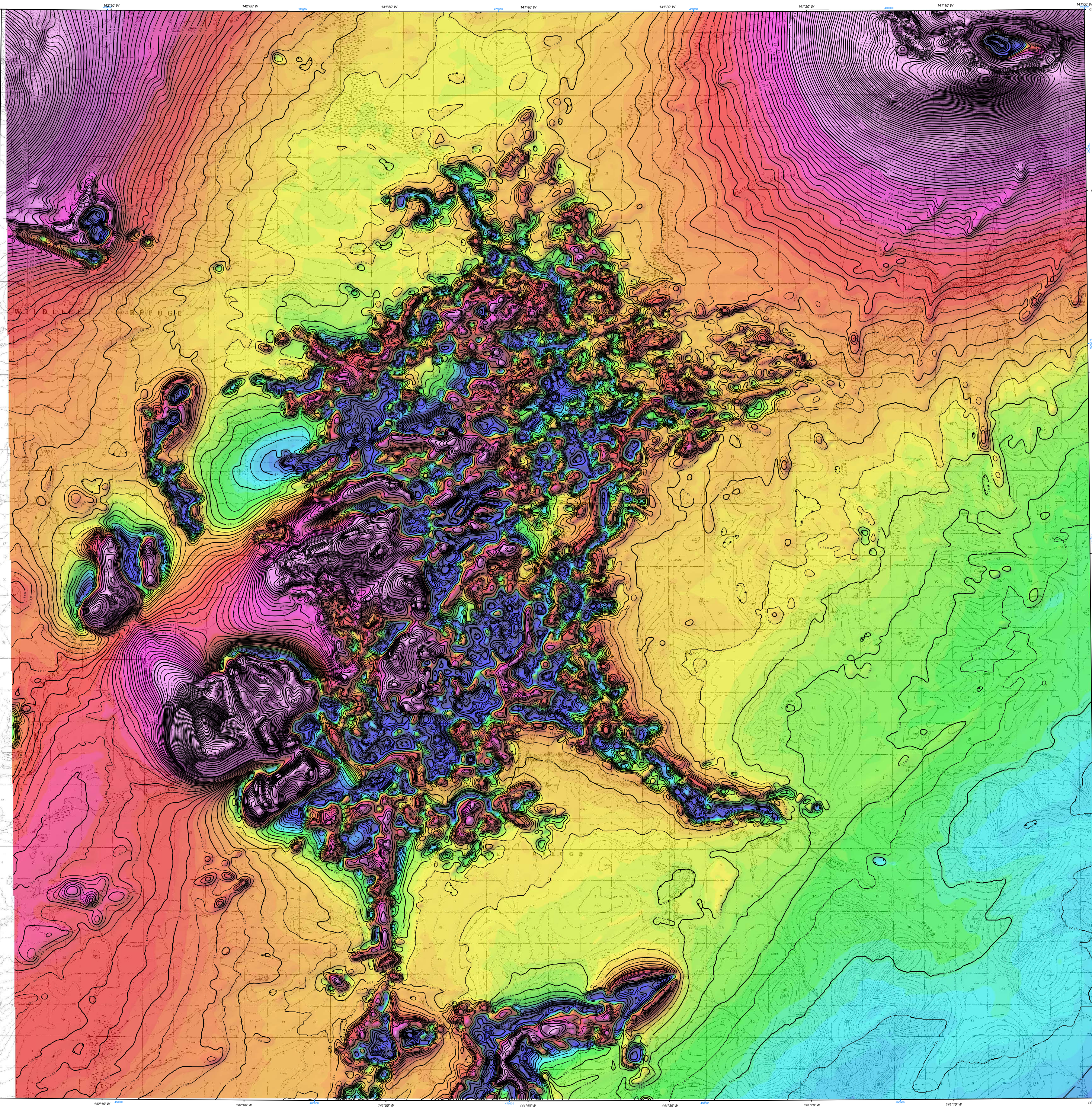
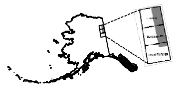
GEOPHYSICAL REPORT 2019-1
Residual magnetic intensity grid and contours; scale 1:63,360; Sheet 2 of 4
Quadrangles: Coleen A-1, A-2, A-3, B-1, B-2, B-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

RESIDUAL MAGNETIC INTENSITY GRID AND CONTOURS

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

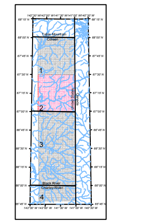
SCALE 1 : 63,360

WGS84 Zone 7N

CONTOUR LEGEND

nT

LOCATION INDEX OF 1:63,360 SCALE MAP



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SURVEY HISTORY

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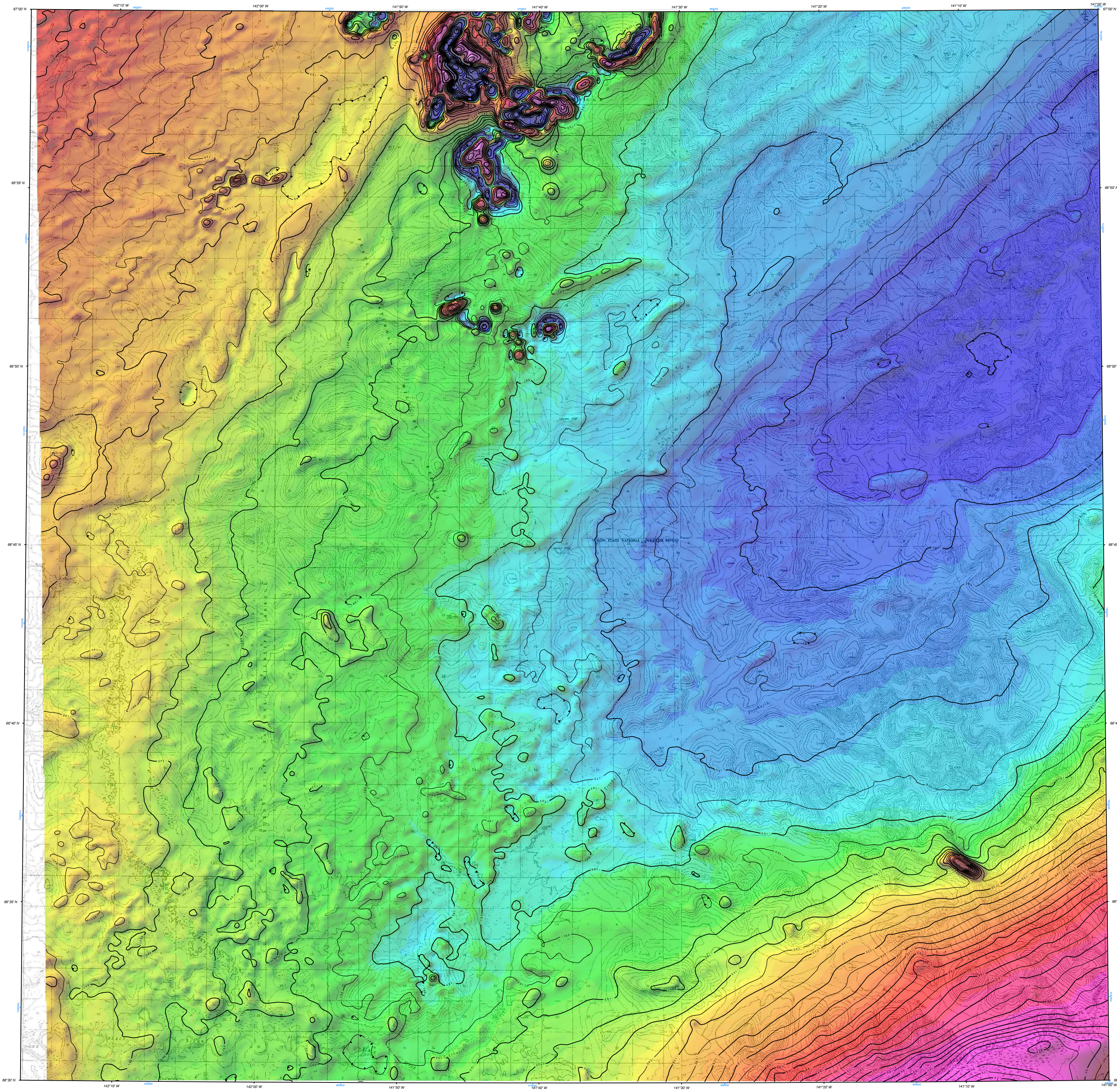
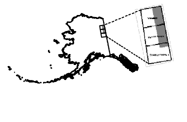
Residual magnetic intensity grid and contours; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



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http://doi.org/10.14509/29737
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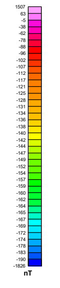
2019

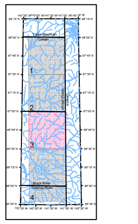


CONTOUR LEGEND

SCALE 1 : 63,360

WGS84 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



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SURVEY HISTORY

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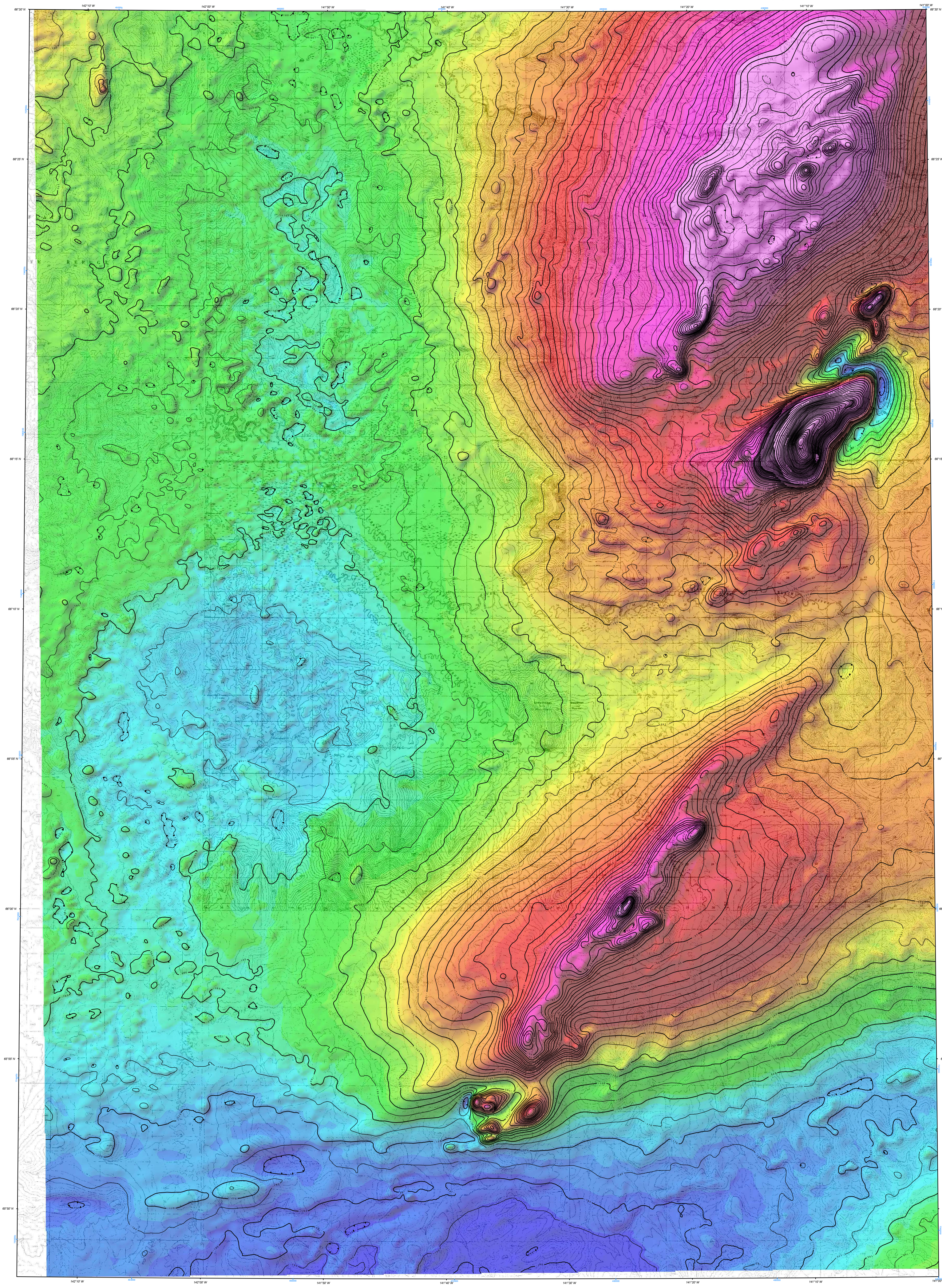
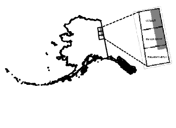
GEOPHYSICAL REPORT 2019-1
Residual magnetic intensity grid and contours; scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION



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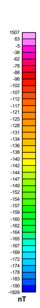
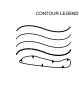
RESIDUAL MAGNETIC INTENSITY GRID AND CONTOURS

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019



CONTOUR LEGEND



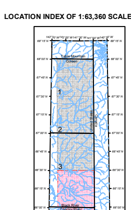
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

WGS84 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



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SURVEY HISTORY

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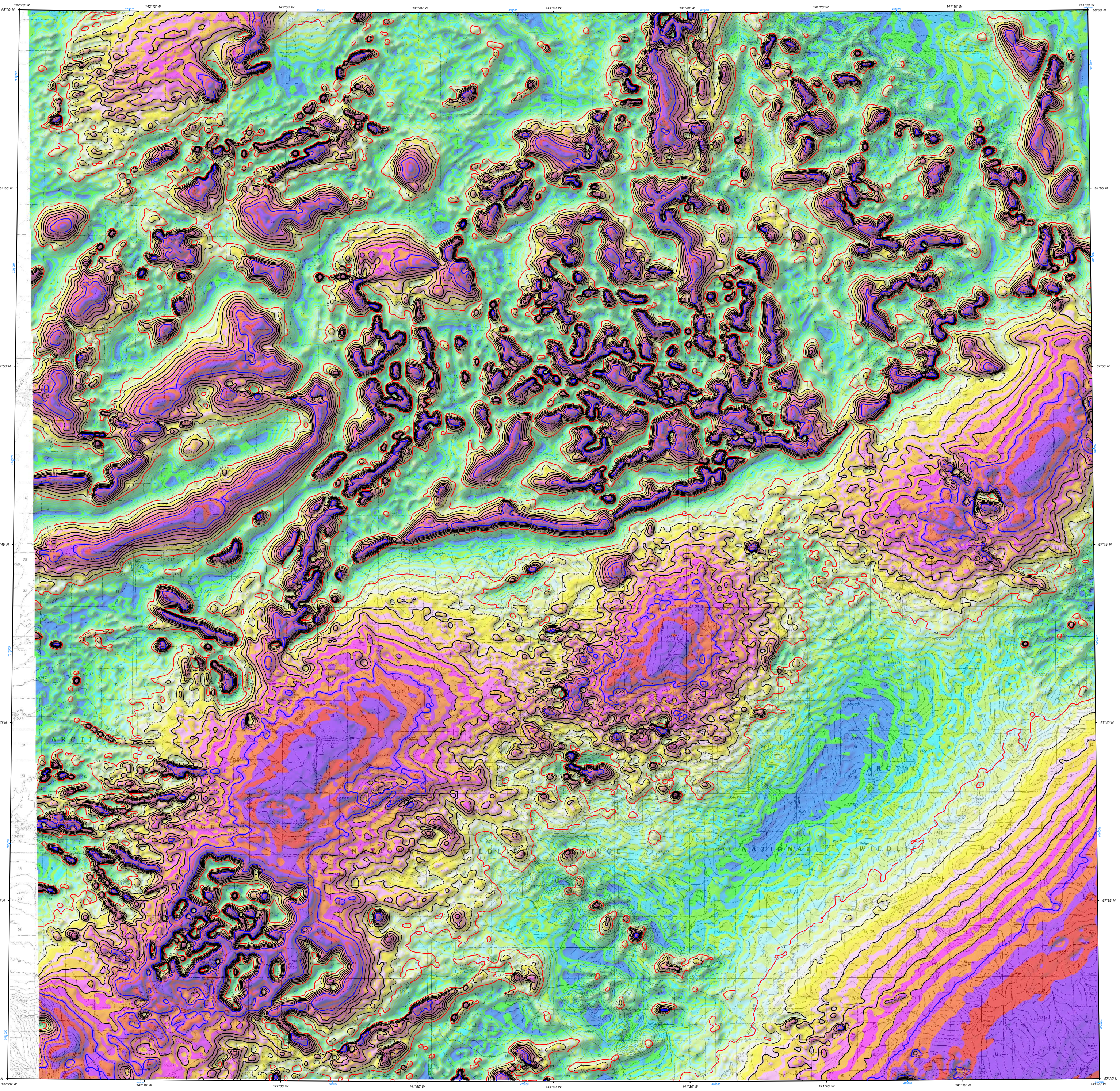
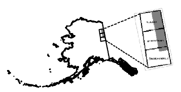
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Analytic signal grid and contours; scale 1:63,360; Sheet 1 of 4
Quadrangles: Coleen C-1, C-2, C-3, D-1, D-2, D-3



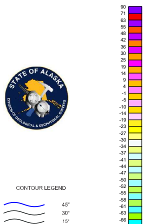
SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

TILT DERIVATIVE GRID AND CONTOURS

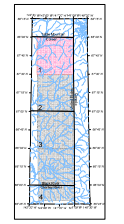
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019



SCALE 1 : 63,360

WGS84 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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TILT DERIVATIVE OF THE MAGNETIC FIELD

The tilt derivative of the magnetic field is its angle in the vertical direction with respect to the horizontal gradient. Computation of the tilt derivative is independent of magnetic intensity and depth to source, and therefore enhances weaker magnetic anomalies. The data presented here were calculated from the residual magnetic intensity grid by the application of horizontal and FFT-based vertical derivative transfer functions, and computation of the angle between the resulting components.

SURVEY HISTORY

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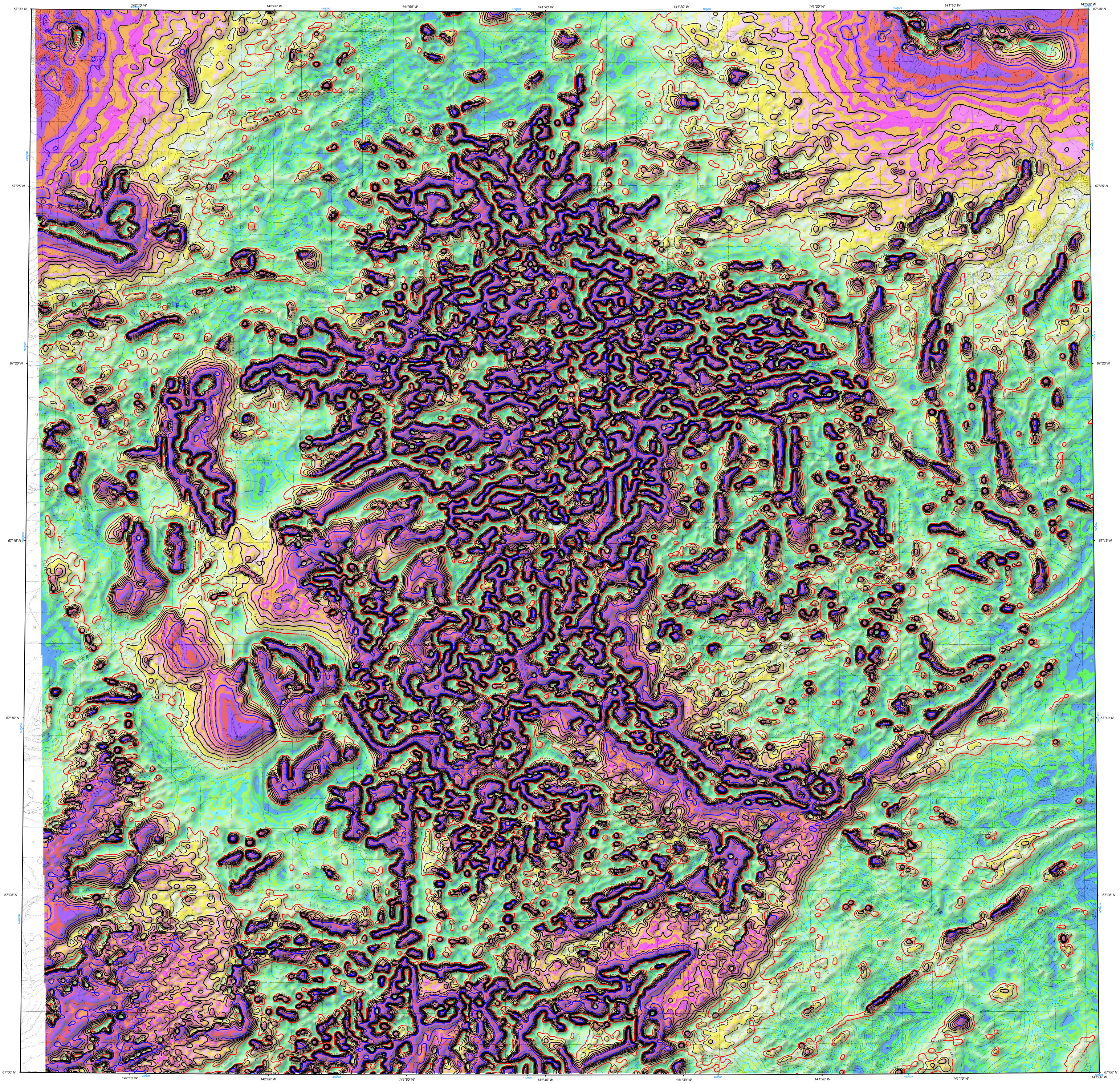
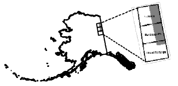
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Tilt derivative grid and contours; scale 1:63,360; Sheet 2 of 4
Quadrangles: Coleen A-1, A-2, A-3, B-1, B-2, B-3



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

TILT DERIVATIVE GRID AND CONTOURS

http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

SCALE 1 / 63,360

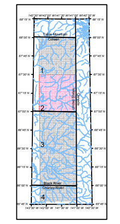
WGS84 Zone 7N

CONTOUR LEGEND

45°, 30°, 15°, 0°, -15°, -30°, -45°

nT

LOCATION INDEX OF 1:63,360 SCALE MAP



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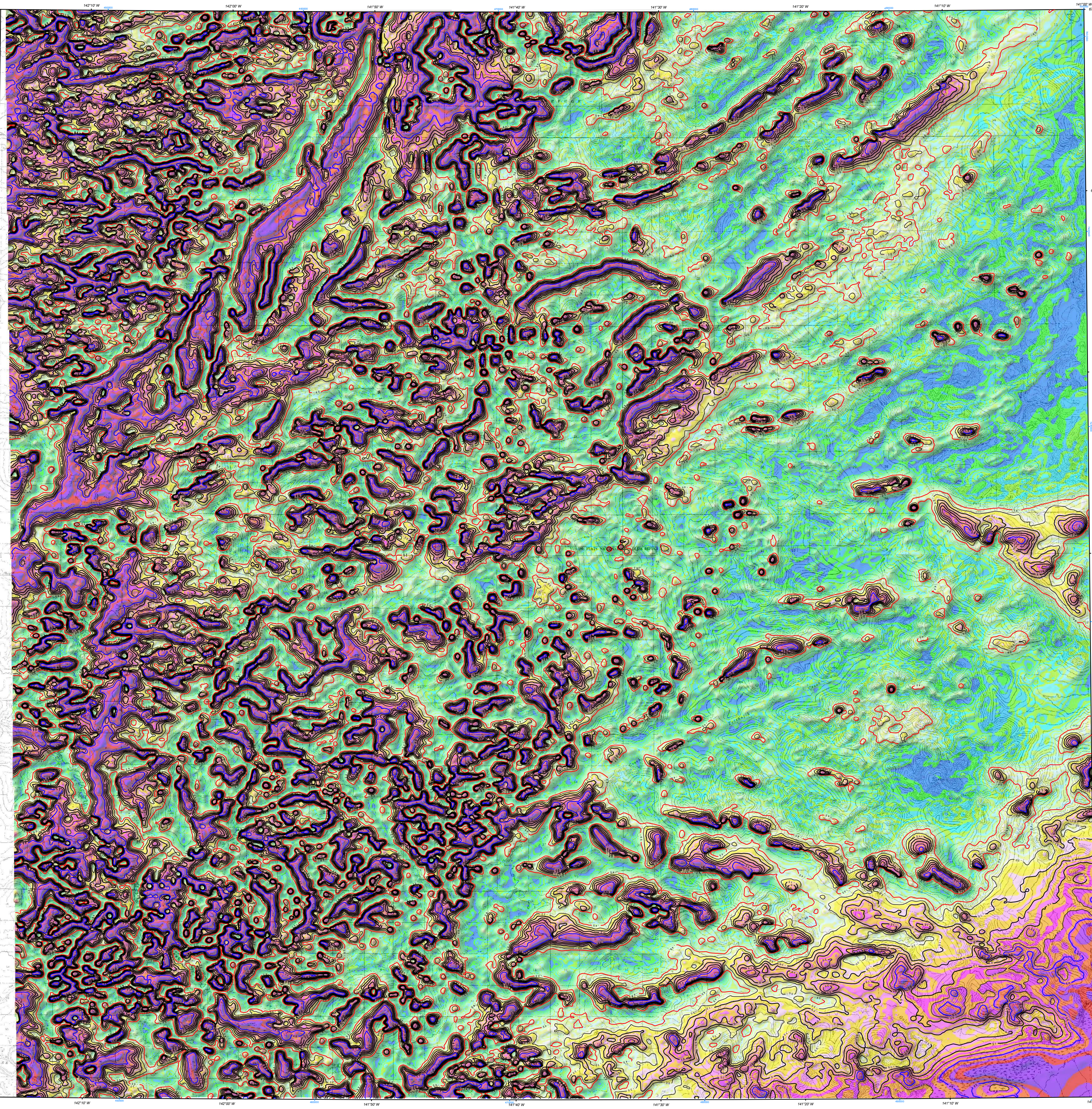
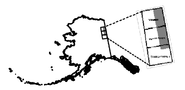
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Tilt derivative grid and contours; scale 1:63,360; Sheet 3 of 4
Quadrangles: Black River C-1, C-2, C-3, D-1, D-2, D-3



SURVEY LOCATION



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TILT DERIVATIVE GRID AND CONTOURS

http://doi.org/10.14509/29737
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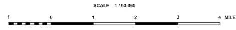
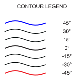
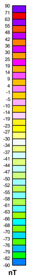
SCALE 1 / 63,360



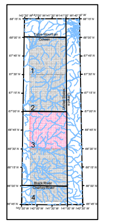
WGS84 Zone 7N

CONTOUR LEGEND





LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by EON Geosciences Inc. from May 5 to June 28, 2017 using a Piper PA-31 Navajo aircraft (registration C-FION). The magnetic data were recorded at 10 Hz using a Geometrics G-822A caesium vapour magnetometer mounted in the tail boom of the aircraft. GNSS positioning data were recorded at 1 Hz using a NovAtel DL-V3 GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a FreeFlight Systems TRA-3500 radar altimeter, a Vaisala PTB110 barometric altimeter, and a vertically mounted video camera. Ground based systems included two GEM Systems GSM-19W Overhauser magnetometers and a NovAtel DL-V3 GNSS receiver.

The nominal traverse and control line separations were, respectively, 300 m and 3000 m. Traverse lines were oriented N0°E with orthogonal control lines. The aircraft flew a predetermined drape surface calculated with a nominal terrain clearance of 100 m, resulting in an average terrain clearance of 233 m.

TILT DERIVATIVE OF THE MAGNETIC FIELD

The tilt derivative of the magnetic field is its angle in the vertical direction with respect to the horizontal gradient. Computation of the tilt derivative is independent of magnetic intensity and depth to source, and therefore enhances weaker magnetic anomalies. The data presented here were calculated from the residual magnetic intensity grid by the application of horizontal and FFT-based vertical derivative transfer functions, and computation of the angle between the resulting components.

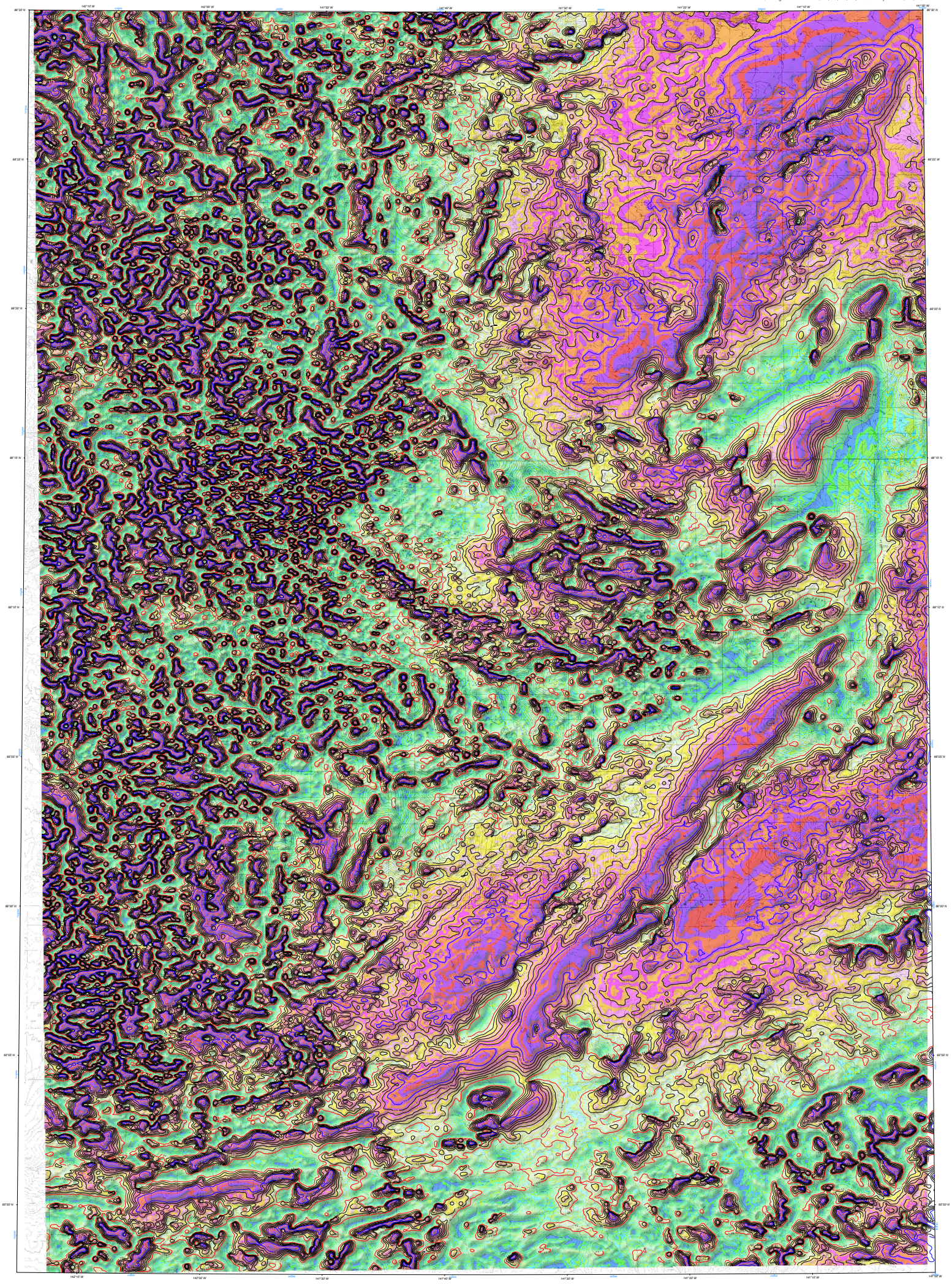
SURVEY HISTORY

Airborne geophysical data for the area were acquired and processed by EON Geosciences Inc. under contract with the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS). Project funded by the US Geological Survey, Mineral Resources Program.

All data and maps produced from this survey are downloadable from the DGGS website (http://dggs.alaska.gov). Products are also available in digital format and maps are available on paper from the DGGS office, 3354 College Road, Fairbanks, Alaska, 99709-3307 (phone 907-451-5010; email dggspubs@alaska.gov).

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2019-1
Tilt derivative grid and contours; scale 1:63,360; Sheet 4 of 4
Quadrangles: Black River A-1, A-2, A-3, B-1, B-2, B-3 & Charley River D-1, D-2, D-3



SURVEY LOCATION

AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE PORCUPINE RIVER REGION, ALASKA

TILT DERIVATIVE GRID AND CONTOURS

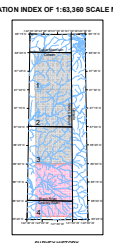
http://doi.org/10.14509/29737
by EON Geosciences Inc.
2019

USGS science for a changing world

STATE OF ALASKA

CONTOUR LEGEND

LOCATION INDEX OF 1:63,360 SCALE MAP



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DESCRIPTIVE NOTES

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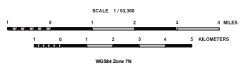
The nominal traverse and control line separations were, respectively, 300 m and 3000 m. Traverse lines were oriented N0°E with orthogonal control lines. The aircraft flew a predetermined drape surface calculated with a nominal terrain clearance of 100 m, resulting in an average terrain clearance of 203 m.

TILT DERIVATIVE OF THE MAGNETIC FIELD

The tilt derivative of the magnetic field is its angle in the vertical direction with respect to the horizontal gradient. Computation of the tilt derivative is independent of magnetic intensity and depth to source, and therefore enhances weaker magnetic anomalies. The data presented here were calculated from the residual magnetic intensity grid by the application of horizontal and FFT-based vertical derivative transfer functions, and computation of the angle between the resulting components.



WGS84 Zone 7N